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NATIONAL ENERGY BOARD

In the Matter of a Public Inquiry
Into Matters Relating to the

NORTHERN CANADA POWER COMMISSION

August 1983

ERRATUM

National Energy Board Report
In the Matter of a Public Inquiry
Into Matters Relating to the

NORTHERN CANADA POWER COMMISSION

August 1983

Add on page (i), Recital and Appearances, the
following:

Appearances :

F. Whyard
F. Dorward

The City of Whitehorse

ERRATUM

Rapport de l'Office national de l'énergie

relative à une enquête publique
sur les questions se rapportant à la

Commission d'énergie du Nord Canadien


Août 1983

Veuillez ajouter à la page (i), Énoncé et comparutions,
ce qui suit:

Comparutions:

F. Whyard
F. Dorward

La ville de Whitehorse



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National Energy Board

1978-1979, 1980-1981, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994-1995, 1996-1997, 1998-1999, 2000-2001, 2002-2003, 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, 2016-2017, 2018-2019, 2020-2021, 2022-2023, 2024-2025, 2026-2027, 2028-2029, 2030-2031, 2032-2033, 2034-2035, 2036-2037, 2038-2039, 2040-2041, 2042-2043, 2044-2045, 2046-2047, 2048-2049, 2050-2051, 2052-2053, 2054-2055, 2056-2057, 2058-2059, 2060-2061, 2062-2063, 2064-2065, 2066-2067, 2068-2069, 2070-2071, 2072-2073, 2074-2075, 2076-2077, 2078-2079, 2080-2081, 2082-2083, 2084-2085, 2086-2087, 2088-2089, 2090-2091, 2092-2093, 2094-2095, 2096-2097, 2098-2099, 2100-2101, 2102-2103, 2104-2105, 2106-2107, 2108-2109, 2110-2111, 2112-2113, 2114-2115, 2116-2117, 2118-2119, 2120-2121, 2122-2123, 2124-2125, 2126-2127, 2128-2129, 2130-2131, 2132-2133, 2134-2135, 2136-2137, 2138-2139, 2140-2141, 2142-2143, 2144-2145, 2146-2147, 2148-2149, 2150-2151, 2152-2153, 2154-2155, 2156-2157, 2158-2159, 2160-2161, 2162-2163, 2164-2165, 2166-2167, 2168-2169, 2170-2171, 2172-2173, 2174-2175, 2176-2177, 2178-2179, 2180-2181, 2182-2183, 2184-2185, 2186-2187, 2188-2189, 2190-2191, 2192-2193, 2194-2195, 2196-2197, 2198-2199, 2200-2201, 2202-2203, 2204-2205, 2206-2207, 2208-2209, 2210-2211, 2212-2213, 2214-2215, 2216-2217, 2218-2219, 2220-2221, 2222-2223, 2224-2225, 2226-2227, 2228-2229, 2230-2231, 2232-2233, 2234-2235, 2236-2237, 2238-2239, 2240-2241, 2242-2243, 2244-2245, 2246-2247, 2248-2249, 2250-2251, 2252-2253, 2254-2255, 2256-2257, 2258-2259, 2260-2261, 2262-2263, 2264-2265, 2266-2267, 2268-2269, 2270-2271, 2272-2273, 2274-2275, 2276-2277, 2278-2279, 2280-2281, 2282-2283, 2284-2285, 2286-2287, 2288-2289, 2290-2291, 2292-2293, 2294-2295, 2296-2297, 2298-2299, 2300-2301, 2302-2303, 2304-2305, 2306-2307, 2308-2309, 2310-2311, 2312-2313, 2314-2315, 2316-2317, 2318-2319, 2320-2321, 2322-2323, 2324-2325, 2326-2327, 2328-2329, 2330-2331, 2332-2333, 2334-2335, 2336-2337, 2338-2339, 2340-2341, 2342-2343, 2344-2345, 2346-2347, 2348-2349, 2350-2351, 2352-2353, 2354-2355, 2356-2357, 2358-2359, 2360-2361, 2362-2363, 2364-2365, 2366-2367, 2368-2369, 2370-2371, 2372-2373, 2374-2375, 2376-2377, 2378-2379, 2380-2381, 2382-2383, 2384-2385, 2386-2387, 2388-2389, 2390-2391, 2392-2393, 2394-2395, 2396-2397, 2398-2399, 2400-2401, 2402-2403, 2404-2405, 2406-2407, 2408-2409, 2410-2411, 2412-2413, 2414-2415, 2416-2417, 2418-2419, 2420-2421, 2422-2423, 2424-2425, 2426-2427, 2428-2429, 2430-2431, 2432-2433, 2434-2435, 2436-2437, 2438-2439, 2440-2441, 2442-2443, 2444-2445, 2446-2447, 2448-2449, 2450-2451, 2452-2453, 2454-2455, 2456-2457, 2458-2459, 2460-2461, 2462-2463, 2464-2465, 2466-2467, 2468-2469, 2470-2471, 2472-2473, 2474-2475, 2476-2477, 2478-2479, 2480-2481, 2482-2483, 2484-2485, 2486-2487, 2488-2489, 2490-2491, 2492-2493, 2494-2495, 2496-2497, 2498-2499, 2500-2501, 2502-2503, 2504-2505, 2506-2507, 2508-2509, 2510-2511, 2512-2513, 2514-2515, 2516-2517, 2518-2519, 2520-2521, 2522-2523, 2524-2525, 2526-2527, 2528-2529, 2530-2531, 2532-2533, 2534-2535, 2536-2537, 2538-2539, 2540-2541, 2542-2543, 2544-2545, 2546-2547, 2548-2549, 2550-2551, 2552-2553, 2554-2555, 2556-2557, 2558-2559, 2560-2561, 2562-2563, 2564-2565, 2566-2567, 2568-2569, 2570-2571, 2572-2573, 2574-2575, 2576-2577, 2578-2579, 2580-2581, 2582-2583, 2584-2585, 2586-2587, 2588-2589, 2590-2591, 2592-2593, 2594-2595, 2596-2597, 2598-2599, 2600-2601, 2602-2603, 2604-2605, 2606-2607, 2608-2609, 2610-2611, 2612-2613, 2614-2615, 2616-2617, 2618-2619, 2620-2621, 2622-2623, 2624-2625, 2626-2627, 2628-2629, 2630-2631, 2632-2633, 2634-2635, 2636-2637, 2638-2639, 2640-2641, 2642-2643, 2644-2645, 2646-2647, 2648-2649, 2650-2651, 2652-2653, 2654-2655, 2656-2657, 2658-2659, 2660-2661, 2662-2663, 2664-2665, 2666-2667, 2668-2669, 2670-2671, 2672-2673, 2674-2675, 2676-2677, 2678-2679, 2680-2681, 2682-2683, 2684-2685, 2686-2687, 2688-2689, 2690-2691, 2692-2693, 2694-2695, 2696-2697, 2698-2699, 2700-2701, 2702-2703, 2704-2705, 2706-2707, 2708-2709, 2710-2711, 2712-2713, 2714-2715, 2716-2717, 2718-2719, 2720-2721, 2722-2723, 2724-2725, 2726-2727, 2728-2729, 2730-2731, 2732-2733, 2734-2735, 2736-2737, 2738-2739, 2740-2741, 2742-2743, 2744-2745, 2746-2747, 2748-2749, 2750-2751, 2752-2753, 2754-2755, 2756-2757, 2758-2759, 2760-2761, 2762-2763, 2764-2765, 2766-2767, 2768-2769, 2770-2771, 2772-2773, 2774-2775, 2776-2777, 2778-2779, 2780-2781, 2782-2783, 2784-2785, 2786-2787, 2788-2789, 2790-2791, 2792-2793, 2794-2795, 2796-2797, 2798-2799, 2800-2801, 2802-2803, 2804-2805, 2806-2807, 2808-2809, 2810-2811, 2812-2813, 2814-2815, 2816-2817, 2818-2819, 2820-2821, 2822-2823, 2824-2825, 2826-2827, 2828-2829, 2830-2831, 2832-2833, 2834-2835, 2836-2837, 2838-2839, 2840-2841, 2842-2843, 2844-2845, 2846-2847, 2848-2849, 2850-2851, 2852-2853, 2854-2855, 2856-2857, 2858-2859, 2860-2861, 2862-2863, 2864-2865, 2866-2867, 2868-2869, 2870-2871, 2872-2873, 2874-2875, 2876-2877, 2878-2879, 2880-2881, 2882-2883, 2884-2885, 2886-2887, 2888-2889, 2890-2891, 2892-2893, 2894-2895, 2896-2897, 2898-2899, 2900-2901, 2902-2903, 2904-2905, 2906-2907, 2908-2909, 2910-2911, 2912-2913, 2914-2915, 2916-2917, 2918-2919, 2920-2921, 2922-2923, 2924-2925, 2926-2927, 2928-2929, 2930-2931, 2932-2933, 2934-2935, 2936-2937, 2938-2939, 2940-2941, 2942-2943, 2944-2945, 2946-2947, 2948-2949, 2950-2951, 2952-2953, 2954-2955, 2956-2957, 2958-2959, 2960-2961, 2962-2963, 2964-2965, 2966-2967, 2968-2969, 2970-2971, 2972-2973, 2974-2975, 2976-2977, 2978-2979, 2980-2981, 2982-2983, 2984-2985, 2986-2987, 2988-2989, 2990-2991, 2992-2993, 2994-2995, 2996-2997, 2998-2999, 3000-3001, 3002-3003, 3004-3005, 3006-3007, 3008-3009, 3010-3011, 3012-3013, 3014-3015, 3016-3017, 3018-3019, 3020-3021, 3022-3023, 3024-3025, 3026-3027, 3028-3029, 3030-3031, 3032-3033, 3034-3035, 3036-3037, 3038-3039, 3040-3041, 3042-3043, 3044-3045, 3046-3047, 3048-3049, 3050-3051, 3052-3053, 3054-3055, 3056-3057, 3058-3059, 3060-3061, 3062-3063, 3064-3065, 3066-3067, 3068-3069, 3070-3071, 3072-3073, 3074-3075, 3076-3077, 3078-3079, 3080-3081, 3082-3083, 3084-3085, 3086-3087, 3088-3089, 3090-3091, 3092-3093, 3094-3095, 3096-3097, 3098-3099, 3100-3101, 3102-3103, 3104-3105, 3106-3107, 3108-3109, 3110-3111, 3112-3113, 3114-3115, 3116-3117, 3118-3119, 3120-3121, 3122-3123, 3124-3125, 3126-3127, 3128-3129, 3130-3131, 3132-3133, 3134-3135, 3136-3137, 3138-3139, 3140-3141, 3142-3143, 3144-3145, 3146-3147, 3148-3149, 3150-3151, 3152-3153, 3154-3155, 3156-3157, 3158-3159, 3160-3161, 3162-3163, 3164-3165, 3166-3167, 3168-3169, 3170-3171, 3172-3173, 3174-3175, 3176-3177, 3178-3179, 3180-3181, 3182-3183, 3184-3185, 3186-3187, 3188-3189, 3190-3191, 3192-3193, 3194-3195, 3196-3197, 3198-3199, 3200-3201, 3202-3203, 3204-3205, 3206-3207, 3208-3209, 3210-3211, 3212-3213, 3214-3215, 3216-3217, 3218-3219, 3220-3221, 3222-3223, 3224-3225, 3226-3227, 3228-3229, 3230-3231, 3232-3233, 3234-3235, 3236-3237, 3238-3239, 3240-3241, 3242-3243, 3244-3245, 3246-3247, 3248-3249, 3250-3251, 3252-3253, 3254-3255, 3256-3257, 3258-3259, 3260-3261, 3262-3263, 3264-3265, 3266-3267, 3268-3269, 3270-3271, 3272-3273, 3274-3275, 3276-3277, 3278-3279, 3280-3281, 3282-3283, 3284-3285, 3286-3287, 3288-3289, 3290-3291, 3292-3293, 3294-3295, 3296-3297, 3298-3299, 3300-3301, 3302-3303, 3304-3305, 3306-3307, 3308-3309, 3310-3311, 3312-3313, 3314-3315, 3316-3317, 3318-3319, 3320-3321, 3322-3323, 3324-3325, 3326-3327, 3328-3329, 3330-3331, 3332-3333, 3334-3335, 3336-3337, 3338-3339, 3340-3341, 3342-3343, 3344-3345, 3346-3347, 3348-3349, 3350-3351, 3352-3353, 3354-3355, 3356-3357, 3358-3359, 3360-3361, 3362-3363, 3364-3365, 3366-3367, 3368-3369, 3370-3371, 3372-3373, 3374-3375, 3376-3377, 3378-3379, 3380-3381, 3382-3383, 3384-3385, 3386-3387, 3388-3389, 3390-3391, 3392-3393, 3394-3395, 3396-3397, 3398-3399, 3400-3401, 3402-3403, 3404-3405, 3406-3407, 3408-3409, 3410-3411, 3412-3413, 3414-3415, 3416-3417, 3418-3419, 3420-3421, 3422-3423, 3424-3425, 3426-3427, 3428-3429, 3430-3431, 3432-3433, 3434-3435, 3436-3437, 3438-3439, 3440-3441, 3442-3443, 3444-3445, 3446-3447, 3448-3449, 3450-3451, 3452-3453, 3454-3455, 3456-3457, 3458-3459, 3460-3461, 3462-3463, 3464-3465, 3466-3467, 3468-3469, 3470-3471, 3472-3473, 3474-3475, 3476-3477, 3478-3479, 3480-3481, 3482-3483, 3484-3485, 3486-3487, 3488-3489, 3490-3491, 3492-3493, 3494-3495, 3496-3497, 3498-3499, 3500-3501, 3502-3503, 3504-3505, 3506-3507, 3508-3509, 3510-3511, 3512-3513, 3514-3515, 3516-3517, 3518-3519, 3520-3521, 3522-3523, 3524-3525, 3526-3527, 3528-3529, 3530-3531, 3532-3533, 3534-3535, 3536-3537, 3538-3539, 3540-3541, 3542-3543, 3544-3545, 3546-3547, 3548-3549, 3550-3551, 3552-3553, 3554-3555, 3556-3557, 3558-3559, 3560-3561, 3562-3563, 3564-3565, 3566-3567, 3568-3569, 3570-3571, 3572-3573, 3574-3575, 3576-3577, 3578-3579, 3580-3581, 3582-3583, 3584-3585, 3586-3587, 3588-3589, 3590-3591, 3592-3593, 3594-3595, 3596-3597, 3598-3599, 3600-3601, 3602-3603, 3604-3605, 3606-3607, 3608-3609, 3610-3611, 3612-3613, 3614-3615, 3616-3617, 3618-3619, 3620-3621, 3622-3623, 3624-3625, 3626-3627, 3628-3629, 3630-3631, 3632-3633, 3634-3635, 3636-3637, 3638-3639, 3640-3641, 3642-3643, 3644-3645, 3646-3647, 3648-3649, 3650-3651, 3652-3653, 3654-3655, 3656-3657, 3658-3659, 3660-3661, 3662-3663, 3664-3665, 3666-3667, 3668-3669, 3670-3671, 3672-3673, 3674-3675, 3676-3677, 3678-3679, 3680-3681, 3682-3683, 3684-3685, 3686-3687, 3688-3689, 3690-3691, 3692-3693, 3694-3695, 3696-3697, 3698-3699, 3700-3701, 3702-3703, 3704-3705, 3706-3707, 3708-3709, 3710-3711, 3712-3713, 3714-3715, 3716-3717, 3718-3719, 3720-3721, 3722-3723, 3724-3725, 3726-3727, 3728-3729, 3730-3731, 3732-3733, 3734-3735, 3736-3737, 3738-3739, 3740-3741, 3742-3743, 3744-3745, 3746-3747, 3748-3749, 3750-3751, 3752-3753, 3754-3755, 3756-3757, 3758-3759, 3760-3761, 3762-3763, 3764-3765, 3766-3767, 3768-3769, 3770-3771, 3772-3773, 3774-3775, 3776-3777, 3778-3779, 3780-3781, 3782-3783, 3784-3785, 3786-3787, 3788-3789, 3790-3791, 3792-3793, 3794-3795, 3796-3797, 3798-3799, 3800-3801, 3802-3803, 3804-3805, 3806-3807, 3808-3809, 3810-3811, 3812-3813, 3814-3815, 3816-3817, 3818-3819, 3820-3821, 3822-3823, 3824-3825, 3826-3827, 3828-3829, 3830-3831, 3832-3833, 3834-3835, 3836-3837, 3838-3839, 3840-3841, 3842-3843, 3844-3845, 3846-3847, 3848-3849, 3850-3851, 3852-3853, 3854-3855, 3856-3857, 3858-3859, 3860-3861, 3862-3863, 3864-3865, 3866-3867, 3868-3869, 3870-3871, 3872-3873, 3874-3875, 3876-3877, 3878-3879, 3880-3881, 3882-3883, 3884-3885, 3886-3887, 3888-3889, 3890-3891, 3892-3893, 3894-3895, 3896-3897, 3898-3899, 3900-3901, 3902-3903, 3904-3905, 3906-3907, 3908-3909, 3910-3911, 3912-3913, 3914-3915, 3916-3917, 3918-3919, 3920-3921, 3922-3923, 3924-3925, 3926-3927, 3928-3929, 3930-3931, 3932-3933, 3934-3935, 3936-3937, 3938-3939, 3940-3941, 3942-3943, 3944-3945, 3946-3947, 3948-3949, 3950-3951, 3952-3953, 3954-3955, 3956-3957, 3958-3959, 3960-3961, 3962-3963, 3964-3965, 3966-3967, 3968-3969, 3970-3971, 3972-3973, 3974-3975, 3976-3977, 3978-3979, 3980-3981, 3982-3983, 3984-3985, 3986-3987, 3988-3989, 3990-3991, 3992-3993, 3994-3995, 3996-3997, 3998-3999, 4000-4001, 4002-4003, 4004-4005, 4006-4007, 4008-4009, 4010-4011, 4012-4013, 4014-4015, 4016-4017, 4018-4019, 4020-4021, 4022-4023, 4024-4025, 4026-4027, 4028-4029, 4030-4031, 4032-4033, 4034-4035, 4036-4037, 4038-4039, 4040-4041, 4042-4043, 4044-4045, 4046-4047, 4048-4049, 4050-4051, 4052-4053, 4054-4055, 4056-4057, 4058-4059, 4060-4061, 4062-4063, 4064-4065, 4066-4067, 4068-4069, 4070-4071, 4072-4073, 4074-4075, 4076-4077, 4078-4079, 4080-4081, 4082-4083, 4084-4085, 4086-4087, 4088-4089, 4090-4091, 4092-4093, 4094-4095, 4096-4097, 4098-4099, 4100-4101, 4102-4103, 4104-4105, 4106-4107, 4108-4109, 4110-4111, 4112-4113, 4114-4115, 4116-4117, 4118-4119, 4120-4121, 4122-4123, 4124-4125, 4126-4127, 4128-4129, 4130-4131, 4132-4133, 4134-4135, 4136-4137, 4138-4139, 4140-4141, 4142-4143, 4144-4145, 4146-4147, 4148-4149, 4150-4151, 4152-4153, 4154-4155, 4156-4157, 4158-4159, 4160-4161, 4162-4163, 4164-4165, 4166-4167, 4168-4169, 4170-4171, 4172-4173, 4174-4175, 4176-4177, 4178-4179, 4180-4181, 4182-4183, 4184-4185, 4186-4187, 4188-4189, 4190-4191, 4192-4193, 4194-4195, 4196-4197, 4198-4199, 4200-4201, 4202-4203, 4204-4205, 4206-4207, 4208-



(i)

Recital and Appearances

IN THE MATTER OF the National Energy Board Act
and sections 22(2) and 20(3) thereof;

IN THE MATTER OF an inquiry into matters relating to
the Northern Canada Power Commission under File
No. 1310-6.

HEARD:

In the Yukon Territory at Whitehorse on 6, 7, 8 and 9 June and in the Northwest Territories at Yellowknife on 13, 14, 15, 16, and 17 June, at Fort Smith on 20 June, at Inuvik on 22 June, at Frobisher Bay on 5 July, at Pangnirtung on 6 July, at Rankin Inlet on 8 July, at Baker Lake on 9 July, at Cambridge Bay on 11 July and at Yellowknife on 13 July, 1983.

BEFORE:

J.R. Hardie	Presiding Member
J.L. Trudel	Member
E.S. Bell	Member

APPEARANCES:

H.D. Williamson	Northern Canada Power
D. Morrison	Commission
J. Smith	
J.W. Beaver	
R.H. Choate	Alberta Power Limited,
H.M. Kay	Canadian Utilities Limited,
	Northland Utilities (NWT)
	Limited, and The Yukon
	Electrical Company Limited
A. Carrel	Association of Yukon Communities
M. Morin	Consumers' Association of Canada - Yukon Branch
R.C. Muir	Cyprus Anvil Mining Corporation
W. Murray Smith	
S. Irving	
P. Dunbar	City of Dawson
P.L. Miller	Esso Resources Canada Limited
T. Dalglish	TCPL Resources Ltd.
B. Woloshyniuk	Whitehorse Chamber of Commerce
K. Shackel	Yukon Conservation Society
C.B. Johnston	Cominco Limited and Pine Point Mines Limited
J. Vertes	
W. MacAleer	City of Yellowknife
T.M. Carey	ICG Utilities (Plains-Western) Ltd.
A. Perry	Northwest Territories Association of Municipalities
L.R. Jason	Yellowknife Chamber of Commerce
D.S. Ferguson	Town of Hay River

(ii)

A. Scheiwiller	Finto Motor Inn, Inuvik
H. Wulf	
T. Detlor	Himself
D. Shinnan	Himself
J. Komaromi	Himself
A.G. Pluim	Inuvik Chamber of Commerce
T. Zubko	Town of Inuvik
M. Elbardo	Mackenzie Hotel, Inuvik
M. Mahé	Kamotiq Inn, Frobisher Bay
D. Miklos, Jr.	Frobisher Inn Limited
R. Ryan	Manager, Pangnirtung Eskimo Co-op Ltd.
P. Fraser	Government of Yukon
J.G. Gilmour	Public Utilities Board of the Northwest Territories
J.G. Gilmour	Government of the Northwest Territories
S.K. Fraser	National Energy Board
A.R. Macdonald	

Table of Contents

	Page
Recital and Appearances	(i)
Table of Contents	(iii)
Abbreviations and Definitions	(v)
1. Introduction	1
2. Background	3
2.1 History of Northern Canada Power Commission	3
2.2 Northern Canada Power Commission Act	3
2.3 Operations	3
2.4 Territorial Regulation of Electric Utilities	4
3. Corporate Structure, Regulation, Miscellaneous Operations	5
3.1 Corporate Structure of Northern Canada Power Commission	5
3.1.1 Type of Crown Corporation	5
3.1.2 Staffing	5
3.1.3 Head Office Location	6
3.2 Regulation and Public Accountability	6
3.2.1 General	6
3.2.2 Regulation of Rates	6
3.2.3 Capital Expenditures	7
3.2.3.1 Planning of Major Projects	7
3.2.3.2 Funding of Major Projects	7
3.3 Non-electric Operations, Waste Heat, and Electrical Operations in Field, British Columbia	8
3.3.1 Non-electric Utility Operations - Inuvik	8
3.3.2 Waste Heat	8
3.3.3 Operations at Field, British Columbia	8
4. Rate Regulation of Northern Canada Power Commission	9
4.1 Basic Principles	9
4.2 Revenue Requirement - Methodology	9
4.2.1 Rate Base	10
4.2.2 Capital	10
4.2.2.1 Debt Forgiveness	10
4.2.2.2 Debt Equity Conversion	11
4.2.2.3 Rate of Return	11
4.3 Revenue Requirement - Components	11
4.3.1 Introduction	11
4.3.2 Head and Regional Office Expenses	12
4.3.3 Operating and Maintenance Expenses	12
4.3.4 Depreciation	12
4.3.5 Return on Rate Base	13

4.4 Rates and Rate Design	13
4.4.1 Present Rate Structure	13
4.4.2 Cost of Service Study	14
4.4.3 Rate Rationalization - Cross-Subsidies	14
4.4.4 Rate Recommendations	14
4.5 Subsidies	15
4.5.1 Introduction	15
4.5.2 Current Direct Subsidy Programs	15
4.5.3 Current Indirect Subsidies	16
4.5.4 Proposals for New Subsidies	16
4.5.5 Cross-Subsidies	16
5 Summary of Major Recommendations	17
APPENDICES	
I Board Order No. EHR-1-83	21
II Procedural Order No. PO-1-EHR-1-83	29

Abbreviations and Definitions

Abbreviations

"NCPC" or "the Commission"	— Northern Canada Power Commission
"NCPC Act"	— Northern Canada Power Commission Act
"NEB" or "the Board"	— National Energy Board
"B.C. Hydro"	— British Columbia Hydro and Power Authority
"kV"	— kilovolt
"kW"	— kilowatt
"MW"	— megawatt (1 000 kW)
"kW.h"	— kilowatt hour
"MW.h"	— megawatt hour

Definitions

"6 and 5" restraint program	— Administered Prices Guidelines
"federal regulatory agency"	— the single federal regulatory agency proposed to regulate NCPC
"the territorial Boards" or "the Boards"	— The Yukon Electrical Public Utilities Board and the Public Utilities Board of the Northwest Territories
"the North" and "north of 60"	— the Yukon Territory and the Northwest Territories
"Coincident Peak Demand Method"	— Allocation of the demand component costs to customers groups in accordance with the demand of each customer group at the time of system peak.
"Non-coincident Peak Demand"	— Allocation of the demand component costs to customer groups in accordance with each individual group's demand irrespective of the group's demand at time of system peak.
"Equalized Rates" (as referred to by NCPC)	— All customers of the same class in a territory are charged identical rates.
"Hydro Entitlement" (or as Referred to by NCPC, "Hydro Allotment")	— In areas served by hydro generation augmented when necessary by diesel generation, the entitlement or hydro allotment establishes the maximum level of consumption for a customer to which the blended hydro rate will apply. Any consumption by the customer in excess of that level will be charged a so called higher diesel rate.
"Hydro Stabilization Fund"	— In hydroelectric systems, a reserve fund is established by collecting in high-water years revenue from customers which exceeds the cost of providing service. This provides a cushion or financial reserve to be drawn down in low-water years thereby providing more stable rates from year to year.

"Life-Line Rate"

- The life-line rate structure prices the first block of energy consumption at some "affordable" rate and is of a size that approximates the energy requirements "essential" to basic human needs.

"Rate Rationalization"

- Rationalization of Rates as was described by a witness for NCPC in the following excerpt from the transcript of 20 June 1983, Page 1551, "Rationalized rate structure is the terminology applied by the Commission, primarily in the Northwest Territories rate zone, wherein the present multiplicity of rate structures applicable to each specific community or area serviced would be gradually eliminated in favour of a smaller number of common rate structures applicable to specific communities and/or rate zones in the NWT, taking into consideration the type of generation available for supply."

"Test Year"

- A period of twelve consecutive months that is representative of the period when the new rates would probably be in effect.

Introduction

This report has been prepared in response to a request made by the Honourable John Munro, Minister of Indian and Northern Affairs, to the Honourable Jean Chrétien, Minister of Energy, Mines and Resources, wherein he sought the assistance of the National Energy Board to provide him with advice on rate matters pertaining to the Northern Canada Power Commission.

In his letter dated 4 January 1983, Mr. Munro explained that, as the Minister responsible for the Northern Canada Power Commission, he wishes to receive advice in preparing a response to recommendations pertaining to NCPC which were contained in the report "Electrical Power North of 60°" known as the Penner Report. This report, dated April 1982, was prepared following an inquiry by a Sub-Committee of the Standing Committee of the House of Commons on Indian Affairs and Northern Development.

Mr. Munro commented on his need for advice on the adequacy of the concepts and methods used by the Commission to determine its rates. The following is a quote from his letter:

"I would like the NEB to review and advise me on the determination of the cost of service, rate design, general principles of rate making and the method of regulation of NCPC. The Board could also study and report on whether any changes are needed in the NCPC Act relating to rates. My overall purpose is to seek an equitable solution to the dilemma of public accountability of NCPC on the one hand and the financial responsibility of the federal government on the other."

In order to gain the necessary insight into the issues raised by Mr. Munro, the Board held an inquiry in accordance with subsection 22(2) of the National Energy Board Act. Interested parties were invited to participate therein, as set out in Board Order No. EHR-1-83 (see Appendix 1).

The Chairman of NCPC, Mr. James Smith, identified in his evidence the objectives which he hoped would be attained as a consequence of the inquiry. He outlined the following problems:

- (1) the lack of provision for public accountability in the current regulatory process governing NCPC;
- (2) the need to provide NCPC with a more solid financial base and to provide for its financial stability in the near and long term;
- (3) the issue of rate rationalization as it applies in the Northwest Territories and the Yukon Territory;
- (4) the need for a review of the financing of plant additions to facilitate the rational planning and the economic sizing of generation and transmission facilities without the imposition of an unreasonable burden on current customers; and
- (5) the need for immediate action to implement recommendations on the foregoing.

In clarifying the objectives of the inquiry, the Board indicated in its opening statement that it did not intend to determine the revenue requirements nor the exact rates to be charged by NCPC but rather that it intended to deal with policies and principles that should be adopted in relation to NCPC in order to meet the requirements of public accountability and financial responsibility to the federal government.

The inquiry commenced on 6 June 1983, sitting for four days during that week in Whitehorse, Yukon Territory. During the following five weeks the Board travelled throughout the Northwest Territories, holding sittings in Yellowknife, Fort Smith, Inuvik, Frobisher Bay, Pangnirtung, Rankin Inlet, Baker Lake and Cambridge Bay. The inquiry concluded in Yellowknife on 13 July. Oral evidence and written submissions were received from a variety of interested parties, including the territorial governments, municipalities, electric utilities, mining companies, business communities, public interest groups and individuals.

Background

2.1 History of Northern Canada Power Commission

The Northwest Territories Power Commission was created as an agency of the government of Canada in 1948 to operate a single hydro electric plant on the Snare River near Yellowknife, Northwest Territories. In 1956 the name of the organization was changed to Northern Canada Power Commission. NCPC gradually took over the operation of generating facilities built by others, and undertook the construction and operation of electrical utility systems at various additional sites. Now, NCPC owns and operates facilities at some 60 locations throughout the Yukon and Northwest Territories in a service area which covers all Canadian territory north of the 60th parallel, except in Quebec and Labrador, and includes numerous communities separated by vast distances. NCPC's only operation outside of the territories is in Yoho National Park, where it supplies electricity to the community of Field, British Columbia.

NCPC's facilities include hydroelectric and diesel generation plants, five transmission systems and numerous isolated electrical distribution systems. Many of the facilities were originally installed by other agencies to serve their particular needs and were transferred to NCPC over the years. Some facilities have been developed to serve isolated mining operations and the associated communities so that a single customer may utilize a large portion of a power station's output. In such locations the economics of the utility service is thus heavily dependent on the business of one customer.

While NCPC distributes electricity to the ultimate consumer in most localities, it supplies power wholesale to two investor-owned companies, The Yukon Electrical Company Limited and ICG Utilities (Plains-Western) Ltd. for distribution in parts of the Yukon Territory and the Northwest Territories respectively. In addition NCPC supplies water, heat and sewage collection services in Inuvik, provides wholesale heat supply in Frobisher Bay and makes residual heat available in various other locations. It also provides other minor services under contract.

2.2 Northern Canada Power Commission Act

The NCPC Act, as amended, established the utility as a Crown corporation which is empowered to supply electric power and other public utilities in northern Canada. NCPC is accountable to Parliament through the Minister of Indian and Northern Affairs. The Act

does not preclude other private corporations and other government agencies from supplying power to communities north of 60°.

The Commission consists of a chairman and four members, all of whom are appointed by the Governor in Council and hold office during pleasure. Two of these members are appointed, one each, on the recommendation of the Commissioner in Council of the Northwest Territories and of the Yukon Territory.

Under the terms of its enabling legislation, NCPC as an agent of Her Majesty may acquire and maintain plants within the Northwest Territories and the Yukon Territory and, with the approval of the Governor in Council, elsewhere in Canada subject to the laws of the province in which the powers are exercised.

Subject to the approval of the Governor in Council, NCPC is required to set ranges of rates for its services applicable to each zone in which it operates; the Yukon and Northwest Territories being separate rate zones. Such rates are required to recover not less than the estimated cost of supplying the public utility service in the rate zone. These costs must include all operating, maintenance and administration costs as well as payments of interest and principal in respect of loans, and a provision for contingencies currently set by Order in Council at four percent of annual sales.

The Minister of Finance may authorize payment to NCPC of \$50,000 from the Consolidated Revenue Fund for the purpose of funding investigations of new electrical generation projects. If a project is constructed, the cost of such investigation is charged to the capital cost of the facility. If a project does not proceed, the cost of the initial investigation is written off as a budgetary charge of the federal government.

Loans to the Commission for capital expenditures may be authorized by the Minister of Finance, on terms and conditions approved by the Governor in Council, from Parliamentary appropriations provided specifically for that purpose. In addition, with the approval of the Governor in Council and on terms and conditions approved by him, the Minister of Finance may authorize loans of up to one million dollars at a time out of the Consolidated Revenue Fund, such loans being submitted to Parliament for approval in the estimates of the following fiscal year.

All accounts of NCPC are subject to the audit of the Auditor General of Canada.

2.3 Operations

NCPC is an unusual electric utility in that it is comprised of over 50 separate power systems serving

populations of some 22 000 located in an area of 482 515 square kilometres* in the Yukon Territory and 48 000 located in an area of 3 379 684 square kilometres* in the Northwest Territories. The two major communities are the cities of Whitehorse and Yellowknife. There is some concentration of population in the southern Yukon and along the Mackenzie River Valley in the Northwest Territories, but most other communities are small and scattered. The total load is about 250 MW and the separate power systems have generating capacities ranging from 80 MW in the Whitehorse area to 61 kW at Jean Marie River in the Northwest Territories. Each of these power systems must be planned and operated independently.

Hydro generation exists in Mayo and in the Whitehorse-Aishihik-Faro area, both in the southern Yukon, and in the Great Slave Lake region in the Northwest Territories. Diesel generators are used in all other locations. The larger systems having hydro-electric plants and diesel systems in regional centres have full-time staff but many of the smaller stations are operated by local part-time operators. The skilled linemen, maintenance men and operators at the regional centres travel to the smaller plants as required to supplement the work of local part-time operators. For major maintenance of machinery and equipment this staff is supplemented when necessary by representatives of the manufacturers.

In the larger diesel plants the staff have the necessary skills to run two or more generators in parallel but in the smaller plants only one generator is used at any one time. For the best fuel economy a larger unit is used to supply loads in the winter, while a smaller unit is used to meet summer loads. In this way the diesel engines can be run closer to full load, the most efficient level, at all times. Additional diesel capacity is installed to provide a reserve in case of breakdown and during routine maintenance. Regular maintenance schedules are planned on the basis of the number of hours the units have run. This situation leads to a wide variation from year to year in maintenance work and the associated cost at each station.

The criterion used for determining the size of a new unit to add capacity at a diesel station is the forecast of load growth for the next five years, thereby leading to fewer changes and greater economy in the long run. Because electricity is a life necessity in the North each plant is planned to provide electricity for

at least 99 percent of the time. In addition, a gas turbine powered generator is held as spare in Edmonton and can be flown by Hercules aircraft to any station in an emergency. Reserve levels are much higher than in southern electric utilities but this situation is unavoidable given the isolation of the stations from each other, the operating difficulties with some semi-skilled staff and the need to provide secure service.

2.4 Territorial Regulation of Electric Utilities

The government of each territory has established an administrative board to regulate the activities of electrical utilities in the territory. The Yukon Electrical Public Utilities Board and the Public Utilities Board of the Northwest Territories are similar in organization, jurisdiction, and powers.

Under the respective ordinances, an electric utility must obtain a franchise from a municipality or from the Commissioner of the Territory, which franchises cannot be granted, renewed, or altered without the approval of the territorial Boards. Complaints from the Commissioner, a municipality, or from a specified number of residents of a service area concerning the rates charged by the utility or a proposed increase in those rates, the service provided by the utility, or the areas to which the utility provides service, are adjudicated by the Boards. The Boards are empowered to determine the rates to be charged, the conditions and manner in which the utility supplies electricity, and to order any reasonable extension of the facilities of the utility.

The Boards must conduct public hearings in the exercise of their powers, with the exception of the approval of franchises by the Yukon Board. Their decisions are final and binding.

As an agent of the federal government, NCPC is not legally subject to regulation by the territorial Boards. In an attempt to address concerns regarding the lack of accountability to its customers, NCPC has since 1976 voluntarily submitted its proposed rate increases to the Boards. The experience has not proven entirely satisfactory, since NCPC has declined to implement certain recommendations of the Boards on the grounds that to do so would entail a conflict with NCPC's governing legislation. Also, NCPC has been criticized by the Auditor General for subjecting itself to such a review.

*Land plus fresh water.

Corporate Structure, Regulation, Miscellaneous Operations

3.1 Corporate Structure of Northern Canada Power Commission

Several submissions addressed the question of the type of utility corporation and management which might best supply power to the North in the future. Some witnesses emphasized the benefits of establishing separate utility companies for each of the Yukon and Northwest Territories to maximize the opportunity for local input and management. Others felt that it might not be appropriate to have two smaller utilities in which management would still be separated by great distances from many customers.

Some 108 of over 350 NCPC employees work in the head office performing the central management, planning, operating and administrative functions which are required in an electric utility company. If NCPC were split into two separate companies with independent management and operations, it is the assessment of the Board that many functions would have to be duplicated with a resulting increase in costs of personnel and material.

The operation of an electric utility such as NCPC requires the expenditure of large sums of money for capital projects and operating expenses, including diesel fuel for electrical generation. Because of the higher costs in the North, the Board assumes that governments would wish to continue subsidies in order to keep NCPC's charges to its customers for electricity at a reasonable level. The territorial governments have limited funds available other than from the federal treasury. Therefore the Board, being of the opinion that the ownership of the utility must reside with the political entity which has financial responsibility, recommends that NCPC continue to operate as a single entity owned by the federal government. The matter of dividing NCPC into two or more corporations could be re-examined at some time in the future when the level of territorial financial independence has been increased.

3.1.1 Type of Crown Corporation

The establishment of NCPC as a Schedule C Crown Corporation under the Financial Administration Act was appropriate in the early years of its operations when it was a small government-owned service agency. In recent years NCPC has become a full-fledged utility. In addition NCPC has been used as an instrument of government policy which has resulted in the management being limited in its freedom to run the utility efficiently.

NCPC has gradually grown from very small beginnings in 1948 to an electric utility with over \$200 million in assets serving over 11 000 customers. The evidence showed that NCPC's management has been successful in providing utility service with generally high reliability throughout its service area. However, the Board believes that NCPC's operations are now sufficiently complex that in considering future appointments to the Commission, persons with expertise in the management of electric utilities should be sought.

In making its various recommendations regarding the future rate regulation of NCPC, the Board has sought to ensure that NCPC operates as a normal public utility — albeit with subsidies to adjust for the special situation of northern residents.

The Board recommends that a corporate form be found for NCPC which leaves it as a federal crown agency but freed of some of the constraints which now inhibit business-like practices. The management of NCPC should be given more control over the operation of the utility so that it can be run as much as possible like an ordinary business. While recognizing that some degree of financial accountability to, and control by, the federal government would still be required, consideration should be given to allowing NCPC to borrow commercially.

3.1.2 Staffing

The total work force of NCPC consists of approximately 350 persons including about 25 part-time operators. Some 108 of the staff are located at the head office, with the remainder being spread throughout the communities served by NCPC.

Witnesses for NCPC stated that its head office staff is at the minimum level required to deal with normal basic operations. In general, submitters to the inquiry expressed little concern regarding the number of NCPC employees. However, some submitters noted an apparent lack of human resources in the field of project planning and development. This function is currently performed by three senior NCPC employees with the assistance of outside consultants. The Commission has also, from time to time, employed consultants regarding cost of service and rate-making matters.

The Board considers that the present staff is adequate for day-to-day operations but subject to economic feasibility, NCPC should consider becoming less dependent on consultants in the performance of work which is carried out internally in most utilities.

3.1.3 Head Office Location

The head office of NCPC was moved from Ottawa to Edmonton in 1973. Edmonton has proved to be an efficient location for administration permitting relatively easy access to the operating locations of NCPC, to Ottawa, and to the other business centres of North America.

The Board is sympathetic to the desire of persons living north of 60°, as expressed by several submitters, to have their electric utility head office located within the territories. However, the head office would still be in a single location and would be as remote from most communities as is Edmonton. In addition, NCPC stated that it would be necessary to continue to have certain functions such as purchasing and expediting of supplies performed in Edmonton or some other southern location.

It seems likely that there will be a growth in numbers of staff and in levels of staff qualifications required by NCPC in the years ahead. If the head office were moved to a more remote location, NCPC might have greater difficulty in recruiting and retaining qualified staff. Higher compensation, including northern allowances, would be required in the North.

The Board is of the opinion that, wherever the head office is located, the concerns of northern residents can be expressed adequately to NCPC through the regional offices and the territorial representatives on the Commission. In addition the Board feels that local concerns can be addressed in public hearings held at various locations in the territories.

The Board recommends that the head office of NCPC remain in Edmonton.

3.2 Regulation and Public Accountability

3.2.1 General

Among the issues considered by the Board were the need for an independent body to regulate NCPC's rates and the extent to which there should be public input into the setting of rates. Consideration was given to whether construction of major projects by NCPC should also be reviewed and approved by an independent body.

No submitter challenged the need for regulating NCPC's operations; however, opinion was divided as to who should do the regulating. NCPC indicated that it would be content to be regulated to the extent and in the manner decided by an appointed regulatory agency. The governments of both the Yukon and Northwest Territories advocated that NCPC come under the complete jurisdiction of the respective territorial Public Utility Boards. Local interest groups took a similar position. Alberta Power Limited on the other hand suggested a two-tier system of regulation. Under its proposal, policy issues would be decided by a federal regulatory agency; while operational, facilities, and rate-making issues would be decided by the respective territorial Public Utility Board. Another proposal, made by two mining companies, was that

NCPC should be regulated solely by a federal regulatory agency, and they suggested that that agency should be the National Energy Board.

This wide divergence of opinion as to who should regulate NCPC clearly indicates that the existing regulatory process is not satisfactory. During the inquiry, the Chairman of NCPC described some of the problems that the Commission has encountered under the current process. By voluntarily submitting its rate proposals for review by the territorial Public Utility Boards and implementing certain of their suggestions, NCPC found itself in disagreement with some of its customers. Some of these disagreements have led to litigation. In addition, NCPC has come under criticism from the Auditor General for implementing certain rates based on advice received from the Public Utilities Boards, which, in the opinion of the Auditor General, have put NCPC in conflict with its Act.

Having considered all the evidence, and the fact that the federal government is, and will likely continue to be, the financial backer of NCPC and the main provider of subsidies until the territories are more financially independent, the Board recommends that the regulation of NCPC, including the approval of rates and of the public convenience and necessity of major capital additions, should be assigned to a single federal regulatory agency. Regulation by a single regulatory agency will also ensure a uniform manner of regulating like aspects of NCPC's rate-setting methodology in both territories.

At present NCPC is required to submit its annual operating budget for approval by the Minister of Indian and Northern Affairs and by Treasury Board. The Board considers that its proposal for a federal regulatory agency to review the revenue requirement of NCPC should eliminate the necessity of other federal government approvals of the operating budget.

3.2.2 Regulation of Rates

Under the NCPC Act, the Commission is required to set its own rates, subject to approval of the Governor in Council. The Commission sets ranges of rates for each location and obtains Governor in Council approval for the ranges. The Commission then sets the actual rates to be charged to each class of customer within these ranges. From a practical point of view there is no effective public input into the setting of rates for any particular location.

The rate structure was partly inherited by NCPC when it took over certain facilities from other agencies. These rates have been adjusted from time to time, sometimes by general percentages to cover increasing costs, at other times to incorporate, at least partially, suggestions of the territorial Public Utility Boards, and in some instances to attempt to remove obvious anomalies. The result is a rather inconsistent mixture of rates in various parts of the areas served.

To alleviate these problems, and to promote the efficiency of the regulatory process, the Board recommends that a duly appointed federal regulatory

agency be given complete and final authority in establishing NCPC's annual revenue requirements for a given period, and in determining the cost-based rates associated therewith. Furthermore, any subsidization of electric power rates should be accomplished outside the regulatory process and, as a question of public policy, must be decided at the political level.

Under the above arrangement, NCPC would be required to submit its rate proposals in the form of an application to the regulatory agency. Upon completion of its review and analysis of the submission, the regulatory agency would approve a revenue requirement for NCPC, and the cost-based rates. The decisions of the regulatory agency would be binding upon NCPC and would not be subject to ministerial override. The decisions should be open to appeal to the courts only on questions of law.

To ensure that all interested parties, including the territorial governments or their respective Public Utility Boards, are given the opportunity to express their views on the rate application to the federal regulatory agency, the Board recommends that public rate hearings be held in each territorial capital. Consideration should also be given to holding public hearings in other locations throughout the territories, wherever warranted by public interest.

The rates thus established would no doubt in many cases be more than the customers can afford to pay. The federal government would determine the amount of, and the method of providing subsidies to the various classes of customer in order to adjust, where needed, the billings to the customers to more acceptable levels. In establishing such subsidies the federal government may wish to receive input from the territorial governments or their Public Utility Boards.

3.2.3 Capital Expenditures

3.2.3.1 Planning of Major Projects

NCPC conducts regular reviews of its system to plan for the necessary refurbishment or replacement of equipment and the occasional addition of new or expanded facilities.

The NCPC Act contains a provision in Section 14(1) which authorizes the Minister of Finance to pay NCPC \$50,000 to fund the investigation of projects. This arrangement has proved to be inadequate as it does not provide sufficient funds to allow NCPC to carry out pre-feasibility studies on potential hydroelectric generation sites in the territories. The Governor in Council recognized the shortcomings of this provision in granting NCPC \$3,150,000 for such studies in the Yukon Territory. NCPC has requested funding to conduct similar studies in the Northwest Territories. If any of the sites being investigated are developed, the funds provided become repayable with accrued interest to Canada.

The Board recommends that different arrangements be made for the funding of major studies in the future. Such studies should be financed by way of provisions included in the cost of service approved by

the regulatory agency, or, in the case of large expenditures, by funding from the federal treasury, upon the recommendation of the regulatory agency.

In respect of each project which it proposes to develop, the Board recommends that NCPC be required to submit an application to the regulatory agency which would consider all aspects of the application and make its recommendation to the Governor in Council. Existing jurisdiction by various other agencies over aspects of the development of power generation and transmission facilities would continue as presently in effect.

From time to time companies other than NCPC have built electric power projects in the North. It is evident to the Board that building a plant sufficient to meet the needs of a particular project or company might have the effect of postponing, perhaps indefinitely, facilities that might serve more effectively both the project itself and other customers. While the Board has no specific recommendations to make on this matter, it appears that an ongoing review of all electric energy projects north of 60° by a senior advisory coordinating body would be desirable.

3.2.3.2 Funding of Major Projects

At present NCPC is required, once new facilities come into service, to begin full payments of interest and principal as established in the loan agreement, with the first annual instalment falling due on the next following 31 March. Under the terms of the NCPC Act this means NCPC has to recover these amounts in full through its rates.

NCPC explained that the inflexibility in the debt repayment terms has had two major consequences. First, it has hampered construction of the most economically sized facility for the long term, since present customers would have to pay for the unused capacity that was installed to meet expected future growth in demand. Second, when a large customer for whom generation is installed takes less than the expected amount of energy, the rates to all customers must be increased. It was felt by some submitters that the federal government should cover the financial risks in these circumstances.

Spokesmen for NCPC proposed that there should be some arrangement permitting the forgiveness of the interest and deferment of repayment of the principal on that part of the capital representing the portion of the facilities that are not utilized.

The Board accepts the desirability of cancelling or deferring capital charges in some instances, and recommends that there be an agreement between NCPC and the federal government guaranteeing financial arrangements to allow hydroelectric projects which are economical in the long term to be developed without risk to northern residents. To control such deferrals, the Board also recommends that the proposed federal regulatory agency consider such financial provisions at the project approval stage and make its recommendation to the Governor in Council.

This proposal should also cover the funding of interconnections with provincial or Alaskan power systems, whether they be built by NCPC or jointly with others.

3.3 Non-electric Utility Operations, Waste Heat, and Electrical Operations in Field, British Columbia

3.3.1 Non-electric Utility Operations — Inuvik

In Inuvik, NCPC distributes steam heat and provides water service and sewage collection service through an insulated above-ground piping system known as a "utilidor". The utilidor system was constructed by the federal government when Inuvik was established in 1958 and was subsequently turned over to NCPC to own and operate.

Evidence was given that NCPC is finding it difficult to deliver heating services at prices which are economically attractive to the customers. Some non-government customers have installed their own oil heating systems and as these customers have stopped purchasing heat, the rates to the remaining customers have risen since costs are spread among fewer customers. The reduced demand for heat could also affect the provision of water and sewage services.

Evidence was also given that the utilidor system at Inuvik, now 25 years old, will require extensive refurbishment in the near future. NCPC stated it had done a minimum of repairs on the utilidors due to lack of funds and that the cost of a major refurbishment would have a severe impact on the future financing of NCPC.

The evidence showed that non-electric services are provided at many locations north of 60° by other agencies.

In view of the substantial financing which will be required to refurbish the utilidor system and since the provision of non-electric utility services creates anomalies in NCPC's basic electric power business, the Board recommends that the non-electric utility business of NCPC at Inuvik be transferred to another agency.

3.3.2 Waste Heat

The evidence showed that, as fuel prices have risen in recent years, NCPC has taken steps to facilitate utili-

zation of waste heat from its diesel engines by allowing the government of the Northwest Territories to make attachments to the cooling and exhaust systems of the machines whereby the government takes waste heat for distribution. Witnesses for NCPC stated that this practice does not cause any operating problems for the Commission nor does it result in any costs to it.

Since this heat source is available, it appears to the Board that it is in the public interest to use it. Provided the necessary facilities to utilize waste heat are installed and operated at no net cost to NCPC, the Board recommends the continuation and extension of this practice.

3.3.3 Operations at Field, British Columbia

NCPC's only utility operation south of the 60th parallel consists of electric power generation and distribution for the community of Field, British Columbia in Yoho National Park.

The evidence showed that the diesel generation of electricity at Field results in high rates and that some subsidies are apparently provided to government employees by the federal government and to some other customers by B.C. Hydro. A written submission to the Board from a resident of Field showed that these customers consider themselves to be remote from NCPC and its main body of customers and that the Field residents have difficulty communicating their concerns to the responsible agencies.

It would appear that costs of electricity in Field could be reduced if the community were interconnected with a major provincial utility system, such as is provided to nearby communities.

The Board feels that it is inappropriate that NCPC be responsible for this one location so far south of the 60th parallel. Accordingly, it recommends that the electric utility operations at Field be taken over by others capable of accepting this responsibility, such as:

B.C. Hydro whose power lines appear to terminate at Golden, British Columbia; or

Alberta Power Limited whose power lines appear to terminate at Lake Louise, Alberta.

Rate Regulation of Northern Canada Power Commission

4.1 Basic Principles

Having reviewed the evidence, the Board believes that NCPC's rates should be based on the cost of providing utility service to its customers. The Board also believes that the appropriate pricing of electricity would be conducive to greater public awareness of the true costs of providing electricity in the North. The Board notes that although the level of cost-based rates will be higher in many regions than what may be considered a reasonable level of rates for NCPC's customers, direct government subsidies outside of the rates could alleviate the problem. These subsidies would be a continuation of or a substitution for the subsidies presently provided.

The costs which NCPC may currently include in the revenue requirement used to determine its rates for a given fiscal year are set out in subsection 10(3) of the NCPC Act. The relevant part of that section reads as follows:

"...the rates to be charged within those schedules or ranges shall not be less than the estimated cost to the Commission, as determined by it, of supplying the public utility in the rate zone, which cost shall include

- a) payments in respect of the interest on, and in respect of the principal amount of, loans made or deemed to have been made to the Commission under this Act in respect of facilities in the rate zone that were used to supply the public utility;
- b) the operating, maintenance, repair and other expenses in respect of such facilities;
- c) the costs of administration and all other expenses of the Commission, as attributed by the Commission, to operations in each rate zone; and
- d) contingency allowances on such basis as may be approved by the Governor in Council."

The contingency allowance has been set by Order in Council at four percent of NCPC's utility sales. Since it is NCPC's intention to recover its costs from its sales revenue, NCPC calculates this contingency as four percent of the expenses referred to in paragraphs (a), (b), and (c) of subsection 10(3). The Commission stated that the objective of the provision of a contingency allowance in its revenue requirement

is to provide a buffer against forecast errors and the occurrence of unforeseen costs.

NCPC calculates a revenue requirement for each rate zone, and for each service area within a rate zone. Although NCPC designs its rates to recover the revenue required from each rate zone, the Board notes that the rates in the individual service areas do not necessarily reflect the specific revenue requirements calculated for each. Details of NCPC's rate design are covered in Section 4.4 of this report.

4.2 Revenue Requirement — Methodology

The Commission stated that there are several factors unique to the environment in which it operates that significantly affect both its ability to forecast revenue and to realize the revenue forecast through its rates. Actual operating costs and sales revenues for specific service areas often turn out to be significantly different from those forecast when establishing the rates. The fluctuations in revenue are due to variations in demand brought about by changes in economic conditions affecting major customers. Factors affecting the forecast of costs include the variations in diesel maintenance costs, unpredictability of fuel costs, variations in the annual precipitation which affect the amount of hydroelectric energy produced in any year, and the resultant cost of replacement by diesel energy in low water years. The four percent contingency has proved to be an insufficient cushion to absorb these differences and as a result NCPC has not always recovered its costs through rates.

NCPC and many submitters called for a re-examination of the current cost of service and contingency formula and discussed alternative approaches to determine the Commission's revenue requirement. Some submitters contended that regulation by the use of a "times interest coverage" method would be more appropriate for NCPC. By this method, NCPC would include in its cost of service an amount which would be fractionally higher than its interest expense. The excess amount, as a substitute for the contingency allowance, would provide for contingencies and gradually accumulate retained earnings.

The Board has a similar concern with both the contingency method and the interest coverage method. Under both, funding is contributed by the customers. The Board is of the opinion that these are not appropriate methods for NCPC.

The practice followed by the Board in its regulation of pipelines is to determine the cost of service by

the rate base/rate of return method. In the rate base/rate of return method of regulation, a utility is allowed to recover from its customers its out-of-pocket operating costs, a charge for depreciation of its facilities, and an amount representing the return on its rate base. The rate base of a utility is the depreciated value of its tangible and intangible property used and useful in the utility service plus an allowance for working capital. The return on the rate base represents the interest cost on the debt component of the rate base plus a return on the equity component.

This method has proved to be equitable to all parties concerned and is used in the regulation of many electric utilities in North America. Unlike the contingency and interest coverage methods, the rate base/rate of return method directly reflects the cost of capital invested in the utility service. This cost can be estimated by use of the standard tests of the financial market.

The Board, having considered all the facts and circumstances under which NCPC provides the utility service, has come to the conclusion that the most appropriate method of determining NCPC's revenue requirement is the rate base/rate of return method.

The Board has determined that the following steps would be necessary in order to implement such a methodology for NCPC, and to establish cost-based rates:

- (1) inventory all usable fixed assets, and record at the original cost to NCPC;
- (2) establish appropriate depreciation rates;
- (3) from (1) and (2) above, establish the net book value of assets in service;
- (4) determine the rate base;
- (5) determine appropriate capital structure, and rate of return;
- (6) using (4) and (5) above, calculate return on rate base;
- (7) examine operating expenses in detail;
- (8) calculate revenue requirement from (6) and (7) above;
- (9) perform a pertinent cost-allocation study;
- (10) determine an appropriate rate structure; and
- (11) calculate rates using (9) and (10) above.

4.2.1 Rate Base

Having recommended that NCPC be regulated using a rate base/rate of return methodology, the Board recommends that NCPC's rate base be comprised of (1) the original cost to the Commission of its used and useful fixed assets, less the accumulated depreciation thereon, (2) an allowance for working capital, and (3) any other amounts which, in the opinion of the appointed regulatory agency, ought to be included.

An allowance for working capital is designed to compensate a company for (1) the funds it expends on operating expenses between the time it provides services to customers and the time when payment is received for the services, and (2) funds invested in various inventories.

In order to determine which assets may qualify for inclusion in the rate base, the Board recommends that NCPC be required to physically inventory all of its fixed assets, identifying those that are presently in use and those which can reasonably be expected to be used in the future.

Although in some instances NCPC's reserve capacity may appear to be high, the Board is of the opinion that in view of the harsh environment and circumstances under which NCPC must operate, the reserve capacity is, in general, reasonable and should be included in the rate base.

4.2.2 Capital

NCPC's present capitalization is almost 100 percent debt. NCPC has received all funds for its capital expenditures from the federal government by way of interest-bearing loans. The principal and interest on loans are repaid on terms and conditions approved by the Governor in Council.

NCPC's debt includes an amount of \$9.2 million representing a defaulted instalment of principal and interest which fell due on 31 March 1977 and which was not paid because of losses incurred in the period 1974 to 1976. The Commission incurs an annual interest expense of some \$600,000 on that amount.

NCPC has also received a working capital loan of \$7.5 million from the federal government. This loan is interest free and is repayable in ten equal annual instalments beginning 31 March 1990.

All submitters who commented on the issue called for an improvement in the financial health of NCPC, and changes to its financial structure through the forgiveness of debt and/or the conversion of debt to equity. It was suggested that NCPC's capital structure should be commensurate with the business risks of selling power in the North.

4.2.2.1 Debt Forgiveness

All submitters who addressed the subject called for some debt forgiveness, which would decrease the interest expense of NCPC and thereby provide rate relief to its customers. The amount suggested for forgiveness varied from prior year losses to 100 percent of the debt.

NCPC stated that 70 percent of its costs in the Northwest Territories are variable and that any reduction of rates resulting from relief from fixed costs, such as the forgiveness of debt interest and principal payments, would be quickly offset by increases in variable costs. In addition NCPC noted the cost of servicing debt would quickly reappear as soon as future investments were undertaken. The evidence shows

that NCPC's variable cost component is significantly higher than that for provincial electric utilities due mainly to higher fuel costs.

NCPC stated that the major portion of its debt is related to hydro facilities. Since the unit cost of hydroelectric energy is currently much lower than that of diesel energy, the forgiveness of debt would increase the cost difference between the two types of generation.

The Board is convinced that forgiving a significant amount or even all of the debt would not treat hydro and diesel area customers equitably and would not reduce average rates in the territories to an acceptable level for a significant length of time. The Board does not believe that it would be appropriate to forgive the total debt of NCPC. However, the Board is of the opinion that NCPC's revenue requirement should not reflect losses incurred by the Commission in prior years. The Board, therefore, recommends that the debt amounting to \$9.2 million, which exists because of prior losses, be forgiven.

In addition, the evidence shows that because of the federal government's "6 and 5" restraint program*, NCPC may incur losses in the years during which the program will be in effect. It is the Board's view that NCPC's customers should not be burdened with such losses that are caused by government policy. The Board, therefore, recommends that any losses incurred by NCPC on account of the "6 and 5" restraint program be made up by direct subsidy payments from the federal government to NCPC.

4.2.2.2. Debt-Equity Conversion

NCPC and many submitters advocated the injection of equity capital into the capital structure of the Commission. If the capital structure contained a significant equity component, a return on equity would provide contingency protection on a continuing basis.

Some submitters advocated the conversion of some or all of the debt to equity. Such a conversion, it was suggested, would reduce NCPC's obligation to pay interest and repay the principal of the debt, and would create the equity base necessary to bear the Commission's normal business risk.

After considering the evidence and views of the participants, the Board is convinced that equity capital has a significant role to play in providing a solution to NCPC's financial problems. The appropriate method for creating the necessary equity capital in NCPC's capital structure is through the conversion of some of the present debt to equity, and, if necessary, through the direct injection of equity capital. The Board recommends that the working capital loan of \$7.5 million be converted to equity. The working capital requirements of NCPC should be investigated and if these exceed

\$7.5 million, the additional funds should be provided by means of further equity.

The Board is of the opinion that it is not appropriate at this time, because of insufficient evidence, to make a determination of the desirable debt/equity ratio for NCPC or of the amount of debt to be converted to equity. The Board, therefore, recommends that the federal government should require the agency charged with regulating NCPC to investigate and recommend an appropriate debt/equity ratio. Sufficient debt should then be converted to equity to attain the desired level. At the time of such conversion, there would no longer be a need for the contingency allowance. The Board therefore recommends discontinuance of the contingency allowance provision at that time.

4.2.2.3 Rate of Return

One of the most important tasks in regulating rates by the rate base/rate of return method is the establishment of a fair rate of return for the utility investment.

In NCPC's case, the Board foresees little problem in determining the cost of its debt. However, the participants in the inquiry had divergent views on the rate of return on equity. While it was suggested by some that the return on equity should be comparable to the return for investor-owned utilities, others suggested that the converted debt should earn no return. NCPC noted that if the return on converted debt were to be higher than the interest on debt, its revenue requirement would be increased. It is the opinion of the Board that it would be more appropriate to deal with rate of return matters in a rate hearing held by the agency charged with regulating NCPC.

4.3 Revenue Requirement – Components

4.3.1 Introduction

As noted earlier, the Board has recommended that NCPC's revenue requirement be calculated using the rate base/rate of return methodology. Under this method, NCPC's revenue requirement would be comprised of its head and regional office expenses, operating and maintenance expenses, depreciation expense, and a return on rate base. The Board recommends that, as at present, separate revenue requirements should be calculated for each of the Yukon and Northwest Territories. The Board also believes that similar revenue requirements should be calculated for any further rate subdivisions of the territories that may be established.

Although each component of the revenue requirement would have to be reviewed at a public rate hearing held by the proposed regulatory agency, the Board has the following comments and recommendations to make regarding specific components.

* see Abbreviations and Definitions, page (v)

4.3.2 Head and Regional Office Expenses

The method presently used by NCPC to allocate head and regional office expenses to the service areas within each rate zone originates from a cost of service study compiled for NCPC by consultants in 1976. Expenses associated with the head office located in Edmonton are allocated using the following method.

A portion of the total head office administration expense is initially prorated to capital expenditures based upon the anticipated level of capital construction and previous years' experience. The remaining head office administration expense is assigned to utility operations. Ten percent of this expense is allocated equally among all service areas, while the remaining 90 percent is deemed 30 percent demand-related, 30 percent energy-related and 30 percent customer cost-related. These demand, energy and customer costs are then prorated to each service area on the basis of kW, MW.h and number of customers, respectively. A similar allocation is made for the regional office expenses incurred in each rate zone.

Because of the nature of this procedure, the resulting allocation to a particular rate zone or service area can fluctuate widely from year to year. For example, a service area in the Northwest Territories may experience relatively constant consumption from year to year. However, if consumption in the Yukon Territory were forecast to decrease significantly, the service area in the Northwest Territories would account for a higher proportion of overall consumption, and therefore would be assigned a higher proportion of head office costs. The Yukon Public Utilities Board has consistently opposed NCPC's use of this method of apportioning head office expenses. As a result of these objections, the Auditor General of Canada, at the request of NCPC, reviewed this procedure but found it to be reasonable.

Because of the possibility of wide fluctuations in allocations from year to year, the Board recommends that NCPC conduct a study to determine whether its current allocation procedure tracks the manner in which head and regional office expenses are actually incurred on behalf of the various service areas. If the current procedure is found to be inappropriate, the study should identify the modifications which need to be made. In addition, because of changes which occur from year to year, the allocation formula should be subject to periodic review.

4.3.3 Operating and Maintenance Expenses

Cross-examination of the various submitters revealed little concern regarding the overall level of NCPC's projected operating and maintenance expenses for the 1983-84 fiscal year. This lack of concern was no doubt due in part to the fact that NCPC's rates for the fiscal year, which have already been approved by the Governor in Council, are not based on the Commission's projected revenue requirement but reflect the

restrictions of the federal government's "6 and 5" restraint program.

A noteworthy component of NCPC's operating and maintenance expense, particularly in the remote areas served by diesel generation, is the fuel and lubricants expense. In these regions fuel and lubricants are projected to account for an average of 44.7 percent of the total expenses before contingency for the test year*, ranging from a low of 40.7 percent in the Mackenzie River area to a high of 48.1 percent in the eastern arctic region. In areas served primarily by hydro, diesel fuel and lubricants account for only about 8.5 percent of the total expenses before contingency.

The Board observes that the unit cost of fuel to NCPC varies significantly from area to area. The total fuel cost in a particular service area depends not only on the base price from suppliers, but also on the source of the fuel, the community where it is to be used, the mode of transporting the fuel, and whether the territorial government imposes a tax on such fuel. The Board notes that in the Northwest Territories rate zone the fuel is subject to a territorial tax of 2.5 cents per litre.

The cost of fuel recorded in NCPC's accounts also depends on the availability of Commission-owned storage facilities. For example, in certain areas in the Northwest Territories where NCPC does not own any storage facilities, its fuel is stored in tanks belonging to the Government of the Northwest Territories. The charge for this service, which is recorded as part of the cost of fuel, includes among other things the interest and depreciation expense associated with the facilities. However, in areas where NCPC has its own storage facilities, the depreciation and interest expenses thereon are not accounted for as a component of the cost of fuel. Figures presented by NCPC for the cost of fuel in its various service areas were, therefore, not directly comparable.

Regarding the reasonableness of each of the components of NCPC's revenue requirement, the Board recommends that the operating and maintenance expenses should henceforth be subject to public scrutiny at rate hearings. In particular, the cost of diesel fuel to NCPC should be thoroughly examined to ensure that such fuel is being acquired in the most cost-effective manner.

4.3.4 Depreciation

NCPC presently uses two different depreciation methods in its calculation of total depreciation expense for the year. For assets placed in service prior to 31 March 1977, NCPC sets annual depreciation expense equal to the principal portion of the payments on the associated loans. Because these loans are amortized on an annuity basis, the resulting depreciation charge

* see Abbreviations and Definitions, page (v)

increases from year to year. The terms of the loans are generally tied to the economic lives of the assets. For the head office building, assets purchased from internally-generated funds, and assets placed in service after 31 March 1977, NCPC calculates depreciation expense on a straight-line basis over the estimated useful lives of the assets.

The Board notes that the Commission is currently required by its Act to charge depreciation and interest expense for each asset whose associated loan remains outstanding. In some cases, these loans represent assets which are no longer in service.

The Board recommends that, for consistency, NCPC calculate depreciation expense for all of its assets on a straight-line basis over the shorter of the physical or economic life of the assets. Consequently, the Board also recommends that NCPC undertake a depreciation study to determine the physical and economic lives of its assets.

If the use of the straight-line depreciation method results in a cash flow which will not allow NCPC to service its debt, the Board suggests the repayment term of the loans should be adjusted accordingly.

To be consistent with the concept of "used and useful" equipment as it applies to both rate base and the associated expenses, the Board recommends that NCPC's revenue requirement should not reflect costs associated with assets from which its customers no longer derive any benefit. Furthermore, the Board recommends that outstanding loans incurred in respect of such assets should be forgiven.

4.3.5 Return on Rate Base

The Board's comments regarding return on rate base are set out in Section 4.2 of this Chapter.

4.4 Rates and Rate Design

The following sections discuss several aspects of NCPC's existing rate design. The Board's recommendations on rate design may be found in Section 4.4.4.

4.4.1 Present Rate Structure

In the Northwest Territories, several federal government departments owned and operated remote diesel systems for their own purposes prior to the facilities being turned over to NCPC. These plants also offered services to the communities in which they were located. The government departments had absorbed the fixed charges associated with these installations with the non-government customers paying only the incremental cost of operation. After these facilities were turned over to NCPC the existing rate structures were continued in the first years of operation, leading to the present system of government and non-government rates.

Prior to 1976, the NCPC Act required that the rates charged in each area serviced by a plant had to be equal to the cost of servicing that area. With the amendment of the NCPC Act in 1975, the service area

of NCPC was divided into two major rate zones, one encompassing the Northwest Territories and the other encompassing the Yukon Territory. NCPC could set rates on a rate zone basis to recover the costs in each of these zones, and provision was made that these zones could be further subdivided. NCPC did not consider it opportune to take full advantage of the ability to rationalize rates* between communities. For example, in fixing rates for some years, NCPC increased the previous rates, in some cases inherited rates, by a fixed percentage. This has perpetuated previous anomalies. In some locations, where NCPC acquired facilities with a ten-year contract to supply low-cost power to the federal government, government customers pay a rate that is less than the actual cost of service. In several remote locations, particularly where there has been no major capital expenditure, the revenue is more than the cost of service. Such inconsistencies are the natural consequences of the historical evolution of rates without clear regulatory direction to NCPC.

NCPC generally has set the rates in the areas supplied by hydro generation somewhat higher than the cost of service, thereby providing a cross-subsidy to those customers located in areas served by diesel generation. NCPC's view is that the benefits of large public investments in hydro facilities should accrue not only to those served by such facilities, but also, in some measure, to all customers. Also, the Commission felt that, particularly for the Northwest Territories where the geography of the region makes interconnections uneconomic, such forms of cross-subsidy are a financial alternative to the establishment of a power grid.

The rate schedules filed at the hearing revealed the extent of anomalies in the existing rate structure. There are examples of similar customers served by the same system being charged different rates. These anomalies have been perpetuated by the "6 and 5" restraint program, and in some cases by NCPC's implementation of recommendations of the Public Utilities Boards of the Yukon and Northwest Territories. In the Yukon, NCPC has recognized that the rates charged for wholesale power delivered to The Yukon Electrical Company Limited in the Whitehorse-Aishihik- Faro system are different at Carmacks, Ross River, Whitehorse and Haines Junction. NCPC, in filings with The Yukon Electric Public Utilities Board, proposed to equalize those rates*. This proposal has not been implemented.

The following are examples of other inconsistencies in the rate structure that were noted by the Board:

- the number and size of blocks for energy are different in various service areas;

- the rates at Fort Resolution, even after the interconnection with the Taltson hydro system, still contain

* see Abbreviations and Definitions, page (v)

a government classification and other legacies from the days of diesel generation; and

the spread between the government and non-government rates varies from community to community.

Some submitters receiving service from NCPC showed concern regarding the effect on their bills of the so-called "hydro entitlement"* and some aspects of accounting for specific matters. The Board views these as customer-specific matters which are outside the terms of reference of this inquiry. These matters should be addressed in a rate hearing.

4.4.2 Cost of Service Study

The cost of service study conducted in 1976** showed that the revenue recovered from some bulk customers was below the cost of supplying the service. The Board recognizes that NCPC has made some efforts since 1976 to recover the cost of service from each customer class.

NCPC admitted that the rates in their present form do not all reflect the cost of servicing the particular customer. The Yukon Electrical Company Limited and United Keno Hill Mines Ltd., large customers of NCPC, are not billed demand charges though the cost of service study shows demand-related costs. NCPC stated that the cost of service study has been used only as a guide in establishing the total revenue requirement for each customer class and not necessarily for setting rates for demand and energy. Many shortcomings in the cost of service study surfaced during the inquiry, including the basis of the allocation of head office costs to individual locations. The Board also notes that the customer costs are allocated equally to industrial, domestic and commercial customers without any weighting factors commonly used in electric rate-making practice.

Demand costs are allocated on the basis of the non-coincident customer demand*. One large customer expressed a strong preference for a cost allocation using the coincident peak method*. The Board considers the present method satisfactory at this stage but suggests that sample studies be undertaken, when convenient, to ensure that the various customer classes are fairly treated in the hydro systems. The Board also noted that distribution and transmission costs are not separated, although such separation would be normal in hydro systems.

4.4.3 Rate Rationalization — Cross-Subsidies

Several views on rationalized rate structures were submitted. While some expressed the opinion that subsidies should be separated from the rate structure, it was recognized that rationalized rates would involve some cross-subsidization.

Opinions of the submitters in the Yukon differed as to whether rates should be equalized, rationalized or set at a uniform subsidized level. In the Northwest Territories, rate equalization was not proposed by any of the submitters. Many submitters from the hydro areas preferred a rate structure based on costs in those areas, although they considered that even these rates were too high. The main concern in areas served by diesel generation was for a reduction in rates rather than any particular rate structure. A submitter stated that the rates should be structured so that no industry would cross-subsidize domestic or other consumers.

NCPC and the submitters were questioned about methods to alleviate the reduction of earnings and the attendant effect on other consumers due to the loss of major industrial loads. Hydroelectric projects which account for NCPC's major capital expenditure have all been developed to meet mining loads, but when a mine reduces operations, the fixed costs of the related hydro facility are passed on to the remaining customers in the area. Many submitters agreed that some form of a financial reserve to cover such situations was necessary; however, they felt that the collection of a security deposit or take-or-pay contracts would be too heavy a burden on industry and not conducive to economic growth.

4.4.4 Rate Recommendations

Having considered the evidence presented, the Board recommends that NCPC's rates should generally be based on costs. Therefore, the Board recommends that the cost of service study be updated. The allocation percentages thus obtained should be examined periodically to accurately reflect expenditure in demand-, energy-, and customer-related cost categories.

The Board recommends that, in future, rates be established by the proposed federal regulatory agency following rate hearings with opportunity for participation by all affected parties. While the details of the rates would be determined by the regulatory agency, the Board has the following comments and recommendations that should be considered by that agency.

Since NCPC wished to avoid a sudden change in rates from those that prevailed in the period when there was a legal requirement to recover costs on a plant by plant basis, it still works with some 50 different sets of rates. In order to reduce the number of rate structures, a logical division would be between communities served by the hydro systems and those served only by diesel generation. Rates in the hydro systems are relatively low for the territories and are not much higher than the rates of some small utilities in the remainder of Canada. The remote diesel systems show some cost variation between communities but all have significantly higher costs than the hydro systems.

* see Abbreviations and Definitions, page (v)

** Also discussed in 4.3.2., Head and Regional Office Expenses

In the interests of simplicity, and ease of administration, the Board recommends that in each of the territories there be two rate zones, a hydro rate zone and a diesel rate zone. Rates in each zone would then be related to the costs within the zone and there would be no cross-subsidization between these rate zones. This division would also avoid placing an undue load on the major industrial customers to subsidize the customers in the diesel areas. It would also smooth the rate variations from year to year in individual diesel generation communities due to variations in maintenance and the uneven rate of capital expenditures.

The Board also recommends the elimination of government and non-government classification in the rate structure.

The rates derived as above, particularly in some diesel areas, would undoubtedly be higher than certain customers could afford to pay. In these circumstances, the federal government might consider offering a direct subsidy to such customers, as outlined in Section 4.5 of this Chapter. It is unlikely, however, that the rates for customers in areas supplied by hydroelectric power need to be subsidised. The present subsidies to customers are related to the rates in the capitals of the territories, which are served by hydro generation, and no change in this basis would be necessitated by the Board's rate zone proposal.

The proposed federal regulatory agency should also consider the following additional issues relating to rates:

- a) a reduction in the number of blocks in the rate structure;
- b) the need for life-line rates* in the North; and
- c) the possibility of the establishment of a hydro stabilization fund*.

In the past NCPC has tried to make changes in its rate design on a gradual basis. The Board notes that this practice tends to prolong the period during which inequities exist and may frustrate the achievement of the desired changes. The Board therefore recommends that all the changes proposed herein become effective 1 April 1985, which would coincide with the end of the application of the current "6 and 5" restraint program to NCPC's rates. To implement the Board's recommendations, a decision before the end of 1983 would provide sufficient time for completion of all necessary steps by 1 April 1985.

4.5 Subsidies

4.5.1 Introduction

Although subsidies for electricity were not explicitly referred to by the Minister of Indian and Northern Af-

fairs in his letter of 4 January 1983, the subject cannot be ignored in the context of the cost of electricity in the North. Interested parties raised issues which were either directly or indirectly related to subsidies. The Board notes that there exists a variety of direct and indirect electricity subsidy programs in the North, including the Federal Power Support Program, the Commercial Power Rate Relief Program, government-owned housing subsidies, subsidies for low-rental housing, isolated post allowances, and subsidies or living allowances provided by business enterprises to their employees. Furthermore, the Board notes that, given the high cost of electricity in the North, it appears that subsidies will continue to be required.

During the inquiry, the current subsidy programs for electricity in the North were discussed, as were new subsidy schemes proposed by several interested parties. The issue of cross-subsidization was also addressed.

The existence of subsidies such as the Federal Power Support Program and the Commercial Power Rate Relief Program is a policy choice of the government made on the basis of its social and economic development goals. The Board believes that the choice of the appropriate scheme and the amounts involved should rest with the government which is financially responsible for providing the subsidy.

Subsidy programs result in consumers being provided with price signals that are below the cost of generating, transmitting and distributing the electricity. Because of a lack of estimates of the price elasticity of demand for electricity in the North, no quantitative evidence on the likely impact of price subsidies on consumption was available. Certain intervenors suggested, however, that the potential increase would depend on individuals' incomes and more particularly on the number of and the potential for additional electric appliances in the affected areas. It was also submitted that, since electricity costs in the North are very high, a subsidy is not likely to reduce rates sufficiently to cause a significant increase in consumption.

4.5.2 Current Direct Subsidy Programs

The Federal Power Support Program (FPSP), which was introduced by the federal government in 1978, operates by reducing the rate for the first 700kW.h of electricity consumed each month by non-government domestic consumers to the rate in the territorial capitals. The customer's bill shows both the unsubsidized and the subsidized amounts. The government refunds the difference to NCPC. In the spring of 1983 the federal government decided to extend the FPSP for a two-year period beginning 1 April 1983 and to examine the question of appropriate subsidies during the intervening period.

The Board notes that in general the reaction to the FPSP was favourable. No interested party said that the limit of 700 kW.h per month was unacceptable. However, it was suggested that instead of the flat rate of 700 kW.h per month, this subsidy

*see Abbreviations and Definitions, page (v)

could apply to a fixed percentage of each customer's bill. Both NCPC and interested parties were in favour of the way the program now operates and NCPC stated that it was easy to administer.

The Board is of the opinion that the FPSP is a useful program and that it should be continued on the present basis.

The Commercial Power Rate Relief Program (CPRRP) was established in 1981 and applied retroactively to 1980. It operates by reducing the rate for the first 1 000 kW.h of electricity consumed per month by small non-government commercial customers to the rates in the territorial capitals. To obtain the subsidy an enterprise must apply to the territorial government for a refund and must establish that its annual gross revenue did not exceed \$2 million.

The Board notes that, in contrast to the FPSP, the CPRRP does not appear to be very effective. Most submitters who were potential beneficiaries stated either that they had not heard about the program until recently or that the filing requirements were too onerous compared to the relatively insignificant amount of money to be received. In addition, some indicated that the 1000 kW.h per month was not adequate. As an alternative, some also suggested that the subsidy be related to a fixed percentage of the customer's bill.

The Board suggests that, if a commercial subsidy program is to be continued, it would be appropriate to re-examine the qualifying conditions, and examine the possibility of channelling the subsidy through NCPC, along the lines of the FPSP.

4.5.3 Current Indirect Subsidies

There is a proliferation of other subsidies that act to reduce the cost of electricity in the North. These include subsidies for electricity costs in low-rental and other government-owned housing, and housing and isolated post allowances granted by various employers, including governments. There was no evidence as to the effectiveness, or otherwise, of such programs.

4.5.4 Proposals for New Subsidies

Several interested parties supported a "Political Rate Design" proposal. Under such a scheme electricity rates in the North would be set at some amount, say ten percent, above the rates in British Columbia. Under such a scheme any difference between the revenues collected by applying such rates and NCPC's actual costs would have to be covered by a lump sum subsidy. The Board notes that this scheme appears attractive in terms of equity considerations and ease of administration. However, such a scheme

would subsidize all consumption rather than just some predetermined amount of consumption. Furthermore, the Board suggests that, if such a scheme is chosen, it might be more appropriate to set the "political rate" at a fixed percentage over the average rate for all of southern Canada, or the average of the western provinces. This would have the advantage of including hydro, diesel and thermal generation and not just lower-cost hydro.

In addition, several interested parties recommended a subsidy in the form of a write-off of NCPC's current debt as a means to reduce electricity rates in the North. This suggestion has been dealt with in subsection 4.2.2.1 in connection with debt forgiveness.

Not all submitters were in favour of subsidies. The Board notes the concern expressed that subsidies merely mask the problem and that what is needed is an alternative lower-cost source of electric power.

4.5.5 Cross-Subsidies

Evidence was presented with regard to the existence of cross-subsidization in NCPC's current rates, particular examples being the government rates in the Northwest Territories, the subsidization of the Snare system and remote diesel areas by the Taltson system, and the cases where customers were assessed more than 100 percent of their allocated costs.

With regard to government and non-government rates, NCPC stated that it wished to eliminate government rates in the Northwest Territories over a period of time. Most interested parties agreed that government rates should be eliminated. The Board recommends in subsection 4.4.4 that the government and non-government rate classification should be removed.

With regard to cross-subsidization between hydro and diesel service areas, the Board states in subsection 4.4.4 that it believes a rate design involving two distinct zones within each territory based on type of generation, i.e. hydro and diesel, is appropriate.

With regard to assessing a particular customer class more than 100 percent of its share of costs, NCPC stated it believed that it was the general practice in Canada to have commercial customers subsidizing domestic customers. The Board agrees that this is so, but notes that this would have to be dealt with in the setting of rates by the proposed regulatory agency.

Some submitters supported cost-based rates, i.e. they believed that rates should not be used as a social policy tool. In general, the Board agrees. However, it notes that the appropriate sharing of costs is a difficult issue and almost any rate design will involve some degree of cross-subsidization.

Summary of Major Recommendations

In its submissions to the Board, NCPCC stressed the urgency of action to resolve the problems that it identified. The Commission put forward interim solutions which it believed could be implemented without the need for legislative amendments. The Board is of the opinion that it would be inadvisable to resort to interim solutions as they prolong the period during which inequities exist and may frustrate the provision of permanent solutions to the problems currently facing NCPCC.

The Board, therefore, recommends that all the changes proposed in this report become effective 1 April 1985, which coincides with the end of the application of the current "6 and 5" restraint program to NCPCC's rates. To implement the Board's recommendations, a decision before the end of 1983 would provide sufficient time for completion of necessary steps by 1 April 1985.

These steps would include the establishment of a federal regulatory agency to oversee the rate regulation of NCPCC, the filing of a rate application by NCPCC using the fiscal year 1985-86 as the test year, the holding of public hearings in Whitehorse and Yellowknife and in other locations throughout each territory wherever public interest warrants, the issuance of the decision of the regulatory agency following such hearings and finally the setting of subsidies by the federal government.

The major recommendations proposed by the Board in this report are summarized below. A number of subsidiary recommendations appear in the body of the report. In making these recommendations, the Board recognizes that some of them would require federal legislation, including amendments to the NCPCC Act.

A. Corporate Structure and Operations

- 1 NCPCC should continue to operate as a single entity owned by the federal government. (Ref. 3.1)
- 2 A corporate form should be found for NCPCC which leaves it as a federal crown agency but freed of some of the constraints which now inhibit business-like practices. (Ref. 3.1.1)
- 3 The head office of NCPCC should remain in Edmonton. (Ref. 3.1.3)
- 4 In considering future appointments to the Commission, persons with expertise in the management of electric utilities should be sought. (Ref. 3.1.1)

- 5 The practice of recovering the waste heat from NCPCC's diesel generators should be continued and extended provided the necessary facilities are installed and operated at no net cost to NCPCC. (Ref. 3.3.2)
- 6 The non-electric utility business of NCPCC at Inuvik should be transferred to another agency. (Ref. 3.3.1)
- 7 The electric utility operations at Field, British Columbia should be taken over by others capable of accepting this responsibility. (Ref. 3.3.3)

B. Framework for Regulation

- 1 The regulation of NCPCC, including the approval of rates and of the public convenience and necessity of major capital additions, should be assigned to a single federal regulatory agency. (Ref. 3.2.1)
- 2 The federal regulatory agency should be given complete and final authority in establishing NCPCC's annual revenue requirements and in determining the cost-based rates associated therewith. (Ref. 3.2.2)
- 3 NCPCC's rates should be established by the federal regulatory agency following rate hearings with opportunity for participation by all affected parties. (Ref. 4.4.4)
- 4 These rate hearings should be held in each territorial capital. Consideration should also be given to holding public hearings in other locations throughout the territories, wherever warranted by public interest. (Ref. 3.2.2)

C. Revenue Requirements

- 1 NCPCC's revenue requirement should be determined using the rate base/rate of return method. (Ref. 4.2)
- 2 NCPCC should be required to physically inventory all of its fixed assets, identifying those that are presently in use and those which can reasonably be expected to be used in the future. NCPCC's revenue requirement should not reflect costs associated with assets from which its customers no longer derive any benefit. (Ref. 4.2.1 and 4.3.4)

Note: References shown are to the sections of the Report where the recommendations are discussed.

- 3 NCPC should undertake a depreciation study to determine the physical and economic lives of its assets, and should calculate depreciation expense for all of its assets on a straight-line basis over the shorter of the physical or economic life of the assets. (Ref. 4.3.4)
- 4 NCPC's operating and maintenance expenses should henceforth be subject to public scrutiny at rate hearings. (Ref. 4.3.3)

D. Capitalization

- 1 The appropriate method for creating the necessary equity capital in NCPC's capital structure is through the conversion of some of the present debt to equity, and, if necessary, through the direct injection of equity capital. (Ref. 4.2.2.2)
- 2 The debt amounting to \$9.2 million, which exists because of prior losses, should be forgiven. (Ref. 4.2.2.1)
- 3 The working capital loan of \$7.5 million should be converted to equity. (Ref. 4.2.2.2)
- 4 Outstanding loans, incurred in respect of assets which are no longer "used and useful", should be forgiven. (Ref. 4.3.4)
- 5 Rate of return matters should be dealt with in a rate hearing held by the agency charged with regulating NCPC. (Ref. 4.2.2.3)

E. Approval and Funding of Major Projects

- 1 In respect of each project which it proposes to develop, NCPC should be required to submit an application to the regulatory agency which would consider all aspects of the application and make its recommendation to the Governor in Council. (Ref. 3.2.3.1)

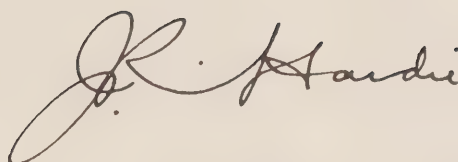
- 2 Project studies should be financed by way of provisions included in the cost of service approved by the regulatory agency, or, in the case of large expenditures, by funding from the federal treasury, upon the recommendation of the regulatory agency. (Ref. 3.2.3.1)

- 3 There should be an agreement between NCPC and the federal government guaranteeing financial arrangements to allow hydroelectric projects which are economical in the long term to be developed without risk to northern residents, and the proposed federal regulatory agency should consider such financial provisions at the project approval stage. (Ref. 3.2.3.2)

F. Rate Design

- 1 NCPC's rates should generally be based on cost. (Ref. 4.4.4)
- 2 In each of the territories there should be two rate zones, a hydro rate zone and a diesel rate zone. (Ref. 4.4.4)
- 3 Government and non-government classifications in the rate structure should be eliminated. (Ref. 4.4.4)
- 4 The proposed federal regulatory agency should consider the following additional issues relating to rates:
 - a) a reduction in the number of blocks in the rate structure;
 - b) the need for life-line rates in the North; and
 - c) the possibility of the establishment of a hydro stabilization fund. (Ref. 4.4.4)
- 5 Any subsidization of electric power rates should be accomplished outside the regulatory process. (Ref. 3.2.2)

The foregoing chapters set forth our findings and recommendations on matters relating to the Northern Canada Power Commission, pursuant to a request dated 4 January 1983 from the Honourable J. Munro, Minister of the Department of Indian and Northern Affairs, to the Honourable J. Chrétien, Minister of Energy Mines and Resources.

A handwritten signature in dark ink, appearing to read "J.R. Hardie". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

J.R. Hardie
Presiding Member

A handwritten signature in dark ink, appearing to read "J.L. Trudel". The signature is cursive, with the first letters of each word being capitalized and prominent.

J.L. Trudel
Member

A handwritten signature in dark ink, appearing to read "E.S. Bell". The signature is cursive, with the first letters of each word being capitalized and prominent.

E.S. Bell
Member

ORDER NO. EHR-1-83

IN THE MATTER OF the National Energy Board Act and sections 22(2) and 20(3) thereof;

IN THE MATTER OF an inquiry into matters relating to the Northern Canada Power Commission under File No. 1310-6.

BEFORE the Board on Thursday the 17th day of March 1983.

WHEREAS the Minister of Energy, Mines and Resources ("the Minister"), at the request of the Minister of Indian Affairs and Northern Development, has, by letter received 4 March 1983, asked the National Energy Board ("the Board") pursuant to section 22(2) of the National Energy Board Act to inquire into and report on matters relating to the Northern Canada Power Commission ("NCPC");

AND WHEREAS the Board finds it advisable to hold a public inquiry to afford an opportunity for interested parties to be heard;

IT IS ORDERED THAT:

1. A public inquiry shall commence in Whitehorse, Yukon Territory, in the Rendez-vous Room of the Klondike Inn, at 9:00 a.m. local time, 6 June 1983, and shall continue in Yellowknife, Northwest Territories, in the Katimavik Room of the Explorer Hotel, at 9:00 a.m. local time, 13 June 1983. The hearing shall continue on such dates and at such locations as the Board may by subsequent order direct, including Frobisher Bay, Rankin Inlet, Cambridge Bay, Inuvik and Fort Smith. Final submissions will be heard in Yellowknife upon completion of the hearings in the above-noted locations.
2. The subject matters of the inquiry are outlined in Appendix I to this Order.
3. To expedite the hearing process, principal examination of subject matters will be conducted as follows:
 - a) Whitehorse - site specific matters relating to the Yukon rate zone, the effect of allocation of head office administration costs and return on rate base on costs in the Yukon rate zone, and general policy matters.
 - b) Yellowknife - site specific matters relating to the Yellowknife service district, the effect of allocation of head office administration costs and return on rate base on costs in the N.W.T.

rate zone and general policy matters. Detailed examination of head office administration costs will also take place in Yellowknife.

- c) other locations - site specific matters relating to the particular service district in which the hearing is being held, the effect of allocation of head office administration costs and return on rate base on costs in the particular service district, and general policy matters.
4. For the purpose of the inquiry, the Board will adopt as the base year the period 1 April 1982 to 31 March 1983 consisting of ten months' actual amounts and two months' projected amounts. The two months' projected figures may be updated by actual amounts during the inquiry. The forward test year will be the period 1 April 1983 to 31 March 1984 from which will be determined the estimated costs for the future period.
5. NCPC shall, unless otherwise authorized by the Board, provide to the Board by 11 April 1983, ten (10) copies of the information set forth in Appendix II to this Order, and shall, as soon as possible, send one (1) copy to each of the locations referred to in paragraph 16.
6. Any person who wishes to make a submission to the Board on the subject matters of the inquiry ("submitter") shall, unless otherwise authorized by the Board:
 - a) on or before 2 May 1983 file with the Secretary of the Board (i) in the case of an individual representing himself as an individual ("individual submitter") one (1) copy of the written submission in either of the two official languages, and (ii) in the case of a submitter other than an individual submitter ("designated submitter") ten (10) copies of the written submission in either of the two official languages;
 - b) set forth concisely in the submission his views with respect to those matters outlined in Appendix I, or parts thereof.
 - c) state in the submission in which of the locations enumerated in paragraph 1 and in which of the official languages he wishes to be heard, and indicate in the submission whether simultaneous interpretation facilities will be required. If a submitter wishes to be heard in a language other than one of the official languages, he shall arrange for a local interpreter. If difficulties are en-

- countered in arranging for an interpreter, the Secretary of the Board should be contacted.
- d) indicate in the submission whether he wishes to receive copies of any or all of the information to be provided by NCPC in response to paragraph 5 of this Order;
 - e) avoid the introduction into evidence of any subjects beyond the scope of the subject matter of this inquiry;
 - f) as soon as possible send (i) in the case of an individual submitter one (1) copy of the written submission to NCPC, and one (1) copy to each of the locations referred to in paragraph 16, and (ii) in the case of a designated submitter one (1) copy of the written submission to NCPC and each other designated submitter, as determined according to a list to be provided by the Board from time to time to all designated submitters, and one (1) copy to each of the locations referred to in paragraph 16.
7. Upon receipt of a copy of a written submission containing a request for any or all of the information to be provided by NCPC pursuant to paragraph 5 of this Order, NCPC shall, as soon as possible, provide the same.
 8. Where NCPC or a submitter wishes to obtain additional information from another party to these proceedings in respect of matters raised in the filings made with the Board, such requests may be made in writing, and the party to whom the request is made shall, as soon as possible, either provide a written response to the request or refer the question to the Board under paragraph 11 or 12 hereof. Additional information requests may also be issued by the Board and responses shall be filed as soon as possible. Both written requests and the responses thereto shall be filed as exhibits at the hearing.
 9. NCPC shall prepare written direct evidence in question and answer form with lines numbered for all their witnesses and shall, on or before 2 May 1983, file ten (10) copies with the Secretary of the Board and, as soon as possible, send one (1) copy of the same to each designated submitter, and one (1) copy to each of the locations referred to in paragraph 16.
 10. Any designated submitter who wishes to adduce direct evidence in the hearing shall, unless otherwise authorized by the Board, prepare direct evidence written in question and answer form with lines numbered and shall, on or before 16 May 1983, file ten (10) copies thereof with the Secretary of the Board, and as soon as possible, send one (1) copy of the same to NCPC and to each other designated submitter and one (1) copy to each of the locations referred to in paragraph 16. Individual submitters need not file written direct evidence.
 11. If any question arises upon which the decision of the Board may be required, one (1) copy of a notice of motion with respect thereto shall be filed with the Secretary of the Board, one (1) copy sent to NCPC and each submitter who might be affected, and one (1) copy to each of the locations referred to in paragraph 16, and the motion shall be heard by the Board at a date to be fixed by it.
 12. Any party who has documents which are required by any Order of the Board relating to this hearing to be sent to other parties to the hearing and who feels that this requirement of service would create an undue burden on him, may apply to the Board for relief from the requirement of service. If relief is granted, the party shall provide the Board with such number of copies of the documents in respect of which relief was granted as the Board may request, which copies shall be available for public examination at the offices of the Board and with the Court Clerk during the hearing. The party shall also make these documents available at such locations and in such number of copies as the Board may direct.
 13. Documents which are required by any Order of the Board relating to this hearing to be sent to other parties to the hearing may be sent by regular mail.
 14. Procedural Orders will be issued by the Board with respect to the conduct of the hearing.
 15. The documents listed in Appendix III are in the public domain and will form part of the Board's record in the inquiry. This list may be updated from time to time and copies will be available for examination at the locations listed in paragraph 16.
 16. Any interested party may examine a copy of all filings made pursuant to this Order at the following locations:

National Energy Board
Trebla Building,
473 Albert Street
Ottawa, Ontario
K1A 0E5

Northern Canada Power Commission
7909 51st Avenue
P.O. Box 5700, Station "L"
Edmonton, Alberta
T6C 4J8

Northern Canada Power Commission
NWT Regional Office
Laurentian Building,
P.O. Box 1860
Yellowknife, NWT
X1A 2P4

Northern Canada Power Commission
Yukon Regional Office
31 Federal Building,
P.O. Box 4278
Whitehorse, Yukon Territory
Y1A 1H8

Frobisher Bay Centennial Library
P.O. Box 189-A
Frobisher Bay, N.W.T.
X04 0H0

John Ayaruaq Library
Rankin Inlet, N.W.T.
X0C 0G0
Att.: Lynn Taylor

Cambridge Bay Centennial Library
Cambridge Bay, N.W.T.
X0E 0C0

Mary Kaeser Library
Box 630
Fort Smith, N.W.T.
X0E 0P0

Inuvik Centennial Library
Box 1640
Inuvik, N.W.T.
X0E 0T0

DATED at the City of Ottawa, in the Province of
Ontario, this 17th day of March 1983.

NATIONAL ENERGY BOARD

G. Yorke Slader
Secretary

- depreciation expense and depreciation rates
- return on rate base (derived in 2 above)
- contingency

This will include observations on the effect on costs of standardization and non-standardization of equipment and the question of whether the overhead is appropriate to the level of service.

4. Determination of rate design:
 - the need to recover the past, present and future revenue requirement
 - the extent to which rate equalization can, and should be achieved
 - the selection of rate making principles to be applied.
5. An assessment of how NCPC should be regulated, the appropriate method of regulation including *inter alia* the question of whether there should be a procedure for approval of projects prior to expenditures being made, and an examination of the need to maintain financial integrity.
6. Possible development of recommendation respecting amendments to the NCPC Act which might be required in order to implement the regulatory principles addressed above.

Note: It would not be the intention of the Board to involve itself in determining rates for classes of customers in individual locations.

APPENDIX II

APPENDIX I

SUBJECT MATTERS OF THE BOARD'S INQUIRY INTO RATES CHARGED BY NCPC

1. A review of the Rate Base for the base year and the test year including the following items:
 - original cost of plant and equipment employed
 - accumulated depreciation
 - inventory
 - working capital
 - determination of use and usefulness of equipment
 - plant additions/retirements.
2. An examination of rate of return on rate base matters including:
 - capital structure
 - cost of capital for each type of capital
 - possible role of equity capital.
3. Determination of the revenue requirement for the test year based on a review *inter alia* of the following cost of service items:
 - operating and maintenance expenses
 - fuel costs
 - engineering and general administration expenses

INFORMATION TO BE FILED BY NORTHERN CANADA POWER COMMISSION PERTAINING TO THE NATIONAL ENERGY BOARD INQUIRY ON

NORTHERN CANADA POWER COMMISSION

March 1983

The Northern Canada Power Commission is requested to provide information pertaining to its operations giving details as follows:

- (1) As per Attachment A in respect of:
 - (a) Yukon Territory Rate Zone
 - (b) Northwest Territories Rate Zone
 - (c) Field, B.C.
 - (d) Head Office, Edmonton, Alberta, and
 - (e) Northern Canada Power Commission - consolidated.
- (2) As per Attachment B in respect of:
 - (a) Yukon Territory Rate Zone in total, and where applicable, details for:

- (i) the Regional Office, and
- (ii) each service area

- Aishihik - Whitehorse - Faro System
- Dawson
- Johnson's Crossing
- Mayo

- (b) the Northwest Territories Rate Zone in total and where applicable details for:

- (i) the Regional Office, and
- (ii) the following service areas

- Snare-Yellowknife System
- Taltson System
- Inuvik
- Rankin Inlet
- Frobisher Bay
- Cambridge Bay

- (3) Copy of the annual report for the year 1982-83 when available.

The Commission is also requested to file with the National Energy Board one copy of the items listed Attachment C.

Attachment A

FINANCIAL STATEMENTS

The following financial statements are required for each rate zone, etc. (a) covering all utility services, and (b) for only the electric utility function; in respect of a base year of 1 April 1982 to 31 March 1983 and a test year of 1 April 1983 to 31 March 1984:

- (1) Balance sheets as at the beginning of the base year and pro-forma balance sheets as of the beginning and end of the test year.
- (2) Schedules of estimated income, operating revenue, and surplus or deficits for the base year and test year.
- (3) Statements of projected changes in financial position for the base year and statements of projected charges in financial position for the year year.

Attachment B

DETERMINATION OF RATE BASE

- (1) A summary as per Schedule 1 attached, showing the capital invested in assets at each location, categorized by class of asset, as at the end of the base year and test year, total adjustments during the test year, and the projected test year average amounts for the following categories:

- (a) Fixed Plant and Other Assets

- (a) Electric Power and Support Facilities
- (b) Transmission and Distribution Facilities
- (c) Other

- related accumulated depreciation
- net book value

- (b) Working Capital

- (a) Provision for Cash Requirements
- (b) Material and Supplies Inventories
- (c) Prepaid Expenses
- (d) Other Relevant Working Capital Components for an Electric Utility.

- (c) Other Miscellaneous Rate Base Items for Electric Utilities

- (2) Supporting schedules for each rate base item listed in (1), showing the balance in each of the beginning and end of the base year and test year, details and explanations of adjustments to the booked amounts and the projected test year average amounts, and proposed additions or deletions of plant or plant material and operating supplies, supported by sufficient data to reasonably demonstrate that the inclusion thereof in the rate base is justified.

- (3) Details of:

- (i) every completed addition to plant in the base year and any additions to plant expected to be completed in the test year.

- (ii) all retirements, if any, in the base year and expected retirement in the test year including the following information in respect of the retirement of individual items, the original cost of which is in excess of \$25,000:

- (a) description
- (b) date of disposal
- (c) original cost or expenditure
- (d) accumulated depreciation
- (e) net book value
- (f) salvage value, and
- (g) reasons for disposal

- (iii) all disposals having an original cost of less than \$25,000 may be aggregated into a miscellaneous category for which only the following need be provided:

- (a) original cost
- (b) accumulated depreciation
- (c) net book value
- (d) salvage value

- (iv) generation plant under construction at the end of the base year, not included in subparagraph (i) as plant expected to be completed in the test year, listing projects by amount expended and estimated completion date.

- (4) Details of any amount booked in the Electric Utility Assets Control Ledgers of any plant that is not currently used in electric utility operations, setting out a brief description of the plant, including its location, the original cost, accumulated

depreciation, net book value and expected salvage value, if any, and indicating why the plant is not used, and the likelihood that it may be used in the future.

- (5) The depreciation methods used to determine the projected depreciation expense of the test year, a list of the depreciation rates applied to assets depreciated on a straight line basis, and a detailed explanation of any changes in the rates. An explanation of the annuity method of depreciation as used by NCPG and the resultant rates.
- (6) A summary showing separately for each non-electric utility service (heating or water and sewerage), if any, the booked amounts at the end of the base year and test year, total adjustments during the test year, the accumulated depreciation and amortization, the net book value, and the projected test year average amounts.

MAJOR CAPITAL ADDITIONS

Indicate for each major capital addition after 1 April 1973 (in excess of \$1 million) the following:

- (i) a description of the addition,
- (ii) the principal purpose of the addition, and
- (iii) the cost of the addition by major cost component as available.

DEBT CAPITAL AND CONTINGENCY

Debt Capital

A summary for the test year as per Schedule 2 attached, that shows an analysis of the weighted average cost of debt capital projected to be outstanding during the test year and showing in supporting schedules details by rate zone and selected plants of the following:

- (i) terms and conditions of loans outstanding, including principal repayment schedules and applicable interest rates,
- (ii) a reconciliation of Debt Outstanding to assets in place,
- (iii) a schedule of principal and interest payments to be made during the test year.

Contingency

A schedule providing for the test year an explanation for the following:

- (i) the need for a contingency,
- (ii) the determination of the contingency,
- (iii) the amount of the contingency applied for.

COST OF SERVICE - REVENUE REQUIREMENTS (Excluding Return)

Showing separately for Electricity, Heat, Water and Sewer, etc. as per Schedule 3 attached.

- (1) A summary of the projected test cost of service showing in columnar form the forecast test year amounts, corresponding projected amounts, where applicable, for the base year, and the difference between the test year and base year amounts for the following components:

- (i) operating and maintenance expenses
 - (a) salaries and wages
 - (b) employee benefits
 - (c) fuel and lubricants
 - (d) maintenance
 - (e) employee housing
 - (f) support facilities
 - (g) direct plant administration
 - (h) Head/Regional Office Administration
 - (i) others

- (ii) depreciation and amortization of plant

- (iii) taxes, property or grants in lieu of taxes, other than income taxes, if not included under (i) above

- (iv) other relevant cost components

Less

- (v) other income, and miscellaneous operating revenues, i.e. connection charges, interest income, etc.

- (2) A schedule for each cost component of the projected test year cost of service showing in columnar form the items making up the total of the components in subsection (1). Each schedule to show line-by-line by category within the component the following:

- (i) the test year amounts,

- (ii) the base year amounts, and

- (iii) the difference between the test year and base year amounts.

- (3) An explanation to justify each projected test year amount, and, where necessary, calculations, for all significant changes indicated in the difference columns provided under subsection (2). The explanation should show the effect of:

- (i) changes in load forecasts and load characteristics,

- (ii) changes in prices,

- (iii) changes in wage and salary rates,

- (iv) changes in number and utilization of employees, and

- (v) other factors.

Other relevant information, including historical details of projects, errors in budgetary and load forecasting and the effect on rate structure and the Commission's policy on the sale of interruptible power.

- (4) Details of requirements to be fulfilled by your industrial customers to be eligible for your service (e.g., power factor, connection charges, etc.). Submit, if possible, any documents or contracts with large industrial customers.
- (5) Supporting detailed schedules of diesel fuel costs, for both the base year and test year indicating the following:
 - (i) type of fuel,
 - (ii) source of supply,
 - (iii) cost of fuel, and
 - (iv) amount of fuel held in inventory to serve peak load season for all locations using oil for generation.

Supported by a summary of major long term fuel contracts and an estimate of expected escalations of fuel price in each location.

Any other relevant information, such as transportation costs, territorial taxes and/or subsidies.

- (6) For locations where diesel exhaust heat is used for heating purposes, provide:
 - (i) additional capital cost of heat recovery system, indicating if included in "Fixed Plant and Other Assets" on Page 1 of this Appendix,
 - (ii) any costs incurred in the operation and maintenance of these facilities, and
 - (iii) any revenues received arising from the operation of these facilities.

RATE DESIGN, RATES, AND TARIFFS

- (1) A concise description of NCPC's electric utility system and operations by zone, including a single line diagram of the interconnected systems in Yukon and NWT indicating the voltage levels and lengths of primary lines. Also indicate the number and class of consumers in different voltage levels. For isolated and remote generation, provide a schematic single line diagram or in lieu thereof indicate the voltage level of generation and the voltages of transmission and distribution along with the length of lines and the number of consumers at primary and secondary voltage levels. For interconnected systems and selected plants provide typical weekday and weekend load shapes for the peak load season as well as the low load season. If possible, indicate the seasonal load factors in other locations.

- (2) Indicate the amount of electrical energy, if any used for space heating in all the locations served by you or by your wholesale purchasers.

- (3) Details of the Commission's proposed test year rate design for each zone with explanations of any changes in rate design from that currently in effect including:

a description of the "Fully Distributed Cost Study" employed by NCPC to allocate the projected 1983/84 revenue requirement to (a) each zone (b) each specific service area within each zone, and (c) by rate group, providing illustrative examples, including, where necessary,

- (a) the method used to assign the cost of service to different consumers, including details of allocation of demand and energy charges to customer classes such as industrial, domestic and commercial. Include particulars of any historical influence of recommendations of the Territorial PUBs in regard to these allocations.
- (b) the method used, if any, to allocate demand-related costs between the energy and demand components clearly indicating if such allocation is based on load factor, diversity factors, etc.
- (c) the rationale of calculating the allotment of hydro energy to your wholesale customers (Yukon Electric, etc.), particularly in low water years.
- (d) the method of classification and allocation of energy-related costs.
- (e) the method of classification and allocation of customer-related costs.
- (f) the rates for each rate group if the cross-subsidization currently reflected in the government rates is removed.
- (g) the methods used to allocate costs which are not directly assignable to each service, electric, heating, and sewer and water.
- (h) an example, if possible, of how the loss of revenue due to mine closures impacts on the rates of other consumers.

- (4) Indicate to us your most recent long term and short term load forecasts along with any committed and planned generation additions over the next 10 years.

Northern Canada Power Commission
Determination of rate base
(By rate zone and selected plants)

Line No.	Particulars	BASE PERIOD			TEST PERIOD		
		Beginning of Period	End of Period	Average	Beginning of Period	End of Period	Average
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1.	ELECTRIC UTILITY SERVICE						
2.	Plant in Service						
3.	Electric Power and Support Facilities	—	—	—	—	—	—
4.	Transmission and Distribution Facilities	—	—	—	—	—	—
5.	Other Facilities	—	—	—	—	—	—
6.		—	—	—	—	—	—
7.	Accumulated Depreciation						
8.	Electric Power and Support Facilities	—	—	—	—	—	—
9.	Transmission and Distribution Facilities	—	—	—	—	—	—
10.	Other Facilities	—	—	—	—	—	—
11.		—	—	—	—	—	—
12.	NET PLANT	—	—	—	—	—	—
13.	Allowance for Working Capital			—			—
14.	Total Electric Utility Rate Base			—			—
15.	OTHER UTILITY SERVICES						
16.	HEATING SERVICE						
17.	Plant in Service	—	—	—	—	—	—
18.	Accumulated Depreciation	—	—	—	—	—	—
19.	Net Plant in Service	—	—	—	—	—	—
20.	Allowance for Working Capital			—			—
21.	TOTAL HEATING RATE BASE			—			—
22.	SEWERAGE AND WATER SERVICES						
23.	Plant in Service	—	—	—	—	—	—
24.	Accumulated Depreciation	—	—	—	—	—	—
25.	Net Plant in Service	—	—	—	—	—	—
26.	Allowance for Working Capital			—			—
27.	Sewerage and Water Rate Base			—			—
28.	TOTAL PLANT RATE BASE			—			—

(b) Northwest Territories Rate Zone —
effective April, 1983

NORTHERN CANADA POWER COMMISSION

PRO FORMA EMBEDDED COST OF LONG TERM DEBT

TEST YEAR AS AT

					Interest	Annual
Line No.	Description	April 1	March 31	Average	Rate	Cost
(a)	(b)	(c)	(d)	(e)	(f)	(g)
Total		<u> </u>	<u> </u>	<u> </u>		<u> </u>

Schedule 3

NORTHERN CANADA POWER COMMISSION

COST OF SERVICE - REVENUE REQUIREMENT

(BY RATE ZONE AND SELECTED PLANT:)

Line No.	PARTICULAR	BASE YEAR	ADJUSTMENTS	TEST YEAR
(a)	(b)	(c)	(d)	(e)
	ELECTRIC UTILITY SERVICE			
	Cost of Service			
	(Excluding Interest			
	Expense and Contingency)			
	Operating and Maintenance			
	Salaries and Wages			
	Employee Benefits			
	Fuel and Lubricants			
	Maintenance			
	Employee Housing			
	Support Facilities			
	Direct Plant			
	Administration			
	Head/Regional Office			
	Administration			
	Others			
	Depreciation			
	Taxes, other than Income Taxes			
	Other relevant cost components			
	Less Miscellaneous Revenue	(____)	(____)	(____)
	Net Cost of Service	_____	_____	_____
	Interest Expense Contingency	_____	_____	_____
	TOTAL REVENUE REQUIREMENT	_____	_____	_____

WHERE APPLICABLE A SIMILAR BREAKDOWN FOR

1 HEATING SERVICE

2 SEWAGE AND WATER SERVICES

2. NCPC Annual Review for the following years

(a) Year Ended March 31, 1978

(b) Year Ended March 31, 1979

(c) Year Ended March 31, 1980

(d) Year Ended March 31, 1981

(e) Year Ended March 31, 1982

3. Ernst & Whinney report prepared for NCPC

(a) "Analysis of the Factors that Should be Considered in Developing a Rate Rationalization Process for the Northwest Territories" — January 1982.

(b) "Report on the Yukon Electric Public Utilities Board Concerns as Expressed in Order 1981-2", — May 1982.

4. Submission of Northern Canada Power Commission "In the Matter of a Public Hearing before the Yukon Electrical Public Utilities Board to examine the question of an appropriate electricity rate structure for Yukon" — March 15, 1983.

5. NCPD prepared Fully Distributed Cost Summary — 1982-83, based on forecast figures from the 1981-82 Energy and Load Forecast

(a) Print out - dated 1982.06.21

(b) Print out - dated 1983.01.20

6. Hildebrandt-Young & Associates Ltd. reports prepared for NCPC

(a) "Update: Market Forecast, Electric Energy Requirements in the Northwest Territories, 1981-82 - 2001-02".

(b) "Update: Market Forecast, Electric Energy Requirements in Yukon, 1981-82-2001-02".

APPENDIX III

**DOCUMENTS IN THE PUBLIC DOMAIN WHICH
MAY BE REFERRED
TO THE NATIONAL ENERGY BOARD'S INQUIRY**

1. Canada. Parliament. House of Commons. Standing Committee on Indian Affairs and Northern Development. Subcommittee on the Northern Canada Power Commission. Electrical Power North of 60 Degrees: Report of the Subcommittee on the Northern Canada Power Commission. Ottawa, 1982. (Penner Report.)

2. Canada. Task Force on Electrical Energy Costs in the North. Report. Ottawa, 1976. (Indian Affairs and Northern Development.)

Attachment C

1. NCPC Proposed Rate Adjustments:

(a) Yukon Territory Rate Zone —
effective April, 1983

ORDER NO. PO-1-EHR-1-83

IN THE MATTER OF the National Energy Board Act and sections 22(2) and 20(3) thereof;

IN THE MATTER OF an inquiry into matters relating to the Northern Canada Power Commission under File No. 1310-6.

B E F O R E the Board on Tuesday, the 19th day of April 1983.

WHEREAS by Order No. EHR-1-83 the Board advised that a public hearing would be held to inquire into and report on matters relating to the Northern Canada Power Commission ("NCPC");

AND WHEREAS by paragraph 14 of the said Order the Board stated that Procedural Orders would be issued with respect to the conduct of the hearing; IT IS ORDERED THAT the following rules and procedures will apply to the public hearing into matters relating to NCPC:

1. PURPOSE

The purposes of these rules are:

- (a) to promote public understanding of the nature of the proceedings, and to facilitate meaningful participation in the proceedings by all interested persons, and
- (b) to seek to make the hearings as orderly and efficient as possible.

These rules are issued as a statement of how the Board proposes to conduct its proceedings although the Board may from time to time consider it necessary to depart from, amend or supplement these rules. Any matter of procedure not dealt with by these rules will be decided by the Board as the need arises.

2. ORGANIZATION AND SCHEDULING

The hearing will involve sessions in the following locations on the dates specified:

- (a) Whitehorse — Rendez-vous Room of the Klondike Inn commencing 6 June 1983
- (b) Yellowknife — Katimavik Room of Explorer Hotel commencing 13 June 1983
- (c) Fort Smith — Royal Canadian Legion 20 June 1983
- (d) Inuvik — Eskimo Inn 22 June 1983
- (e) Arctic Red River — Community Hall 23 June 1983
- (f) Frobisher Bay — Navigator Inn 5 July 1983
- (g) Pangnirtung — Peyton Enterprises Lodge 6 July 1983
- (h) Rankin Inlet — Rankin Inn Lodge 8 July 1983

- (i) Baker Lake — Resource Centre 9 July 1983
- (j) Cambridge Bay — Cambridge Bay Co-Op 11 July 1983
- (k) Yellowknife — Katimavik Room of the Explorer Hotel commencing 13 July 1983
(for final submissions and argument if any)

The Board will not sit during the week of 27 June 1983.

The hours of sitting will be from 9:00 a.m. to 12:30 p.m. and from 2:00 p.m. to 5:00 p.m. Hearing hours may be extended as required.

In each of the above locations, principal examination of subject matters will be as indicated in paragraph 3 of Order No. EHR-1-83, namely

- a) Whitehorse — site specific matters relating to the Yukon rate zone, the effect of allocation of head office administration costs and return on rate base on costs in the Yukon rate zone, and general policy matters.
- b) Yellowknife — site specific matters relating to the Yellowknife service district, the effect of allocation of head office administration costs and return on rate base on costs in the N.W.T. rate zone and general policy matters. Detailed examination of head office administration costs will also take place in Yellowknife.
- c) other locations — site specific matters relating to the particular service district in which the hearing is being held, the effect of allocation of head office administration costs and return on rate base on costs in the particular service district, and general policy matters.

The order of hearing evidence and submissions in each of the locations will be as follows:

- (a) Direct evidence of NCPC.
- (b) Cross-examination of NCPC witnesses by submitters in accordance with a list to be distributed on the opening day of the hearing in each location, followed by Board Counsel.
- (c) Direct evidence and submissions of submitters in accordance with the list referred to in (b).
- (d) Cross-examination of submissions by other submitters, NCPC, and Board Counsel.

3. EVIDENCE

The subject matters of the inquiry are set out in Appendix I of Order No. EHR-1-83. The Board will hear any evidence or views relevant to these matters.

All testimony shall be given under oath or affirmation. Persons wishing to give testimony and not having legal counsel may request the assistance of Board Counsel.

To expedite the hearing, parties are requested, where possible, to make use of the written question and answer procedure set out in paragraph 8 of Order No. EHR-1-83.

4. FINAL SUBMISSIONS

Any party wishing to make final submissions on any matters relating to the inquiry may do so by way of oral presentation in Yellowknife commencing 13 July 1983 or by way of written submission, to be filed with the Board not later than 18 July 1983.

5. COMMUNICATION WITH THE BOARD

All communications with the Board must be through the Secretary (Tel. (613) 996-2174) or Board Counsel (Tel. (613) 995-2585).

DATED at the City of Ottawa, in the Province of Ontario, this 19th day of April 1983.

NATIONAL ENERGY BOARD

G. Yorke Slader
Secretary

